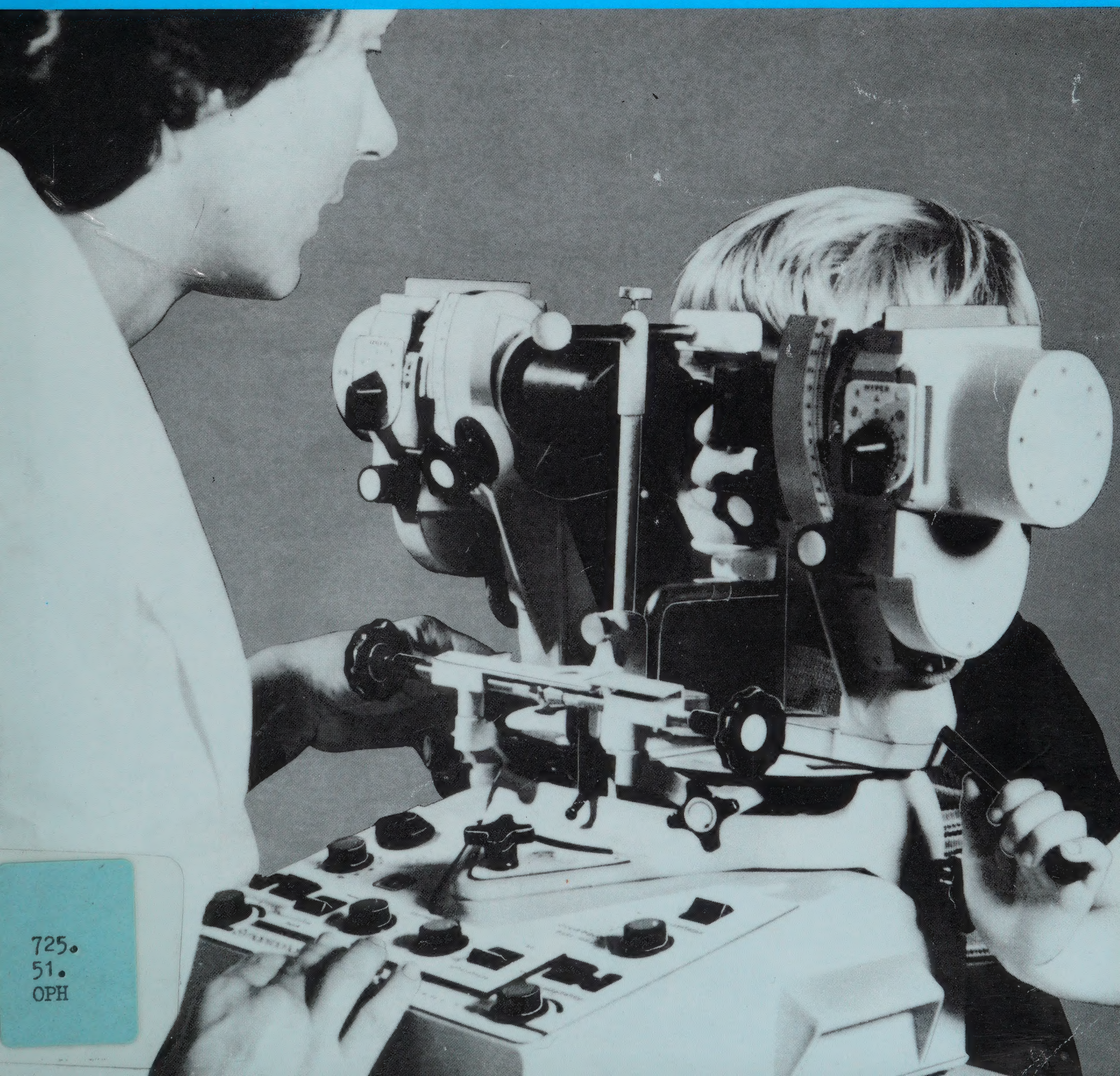
MC0146

HEALTH BUILDING NOTE 39

Ophthalmic Clinic

DEPARTMENT OF HEALTH AND SOCIAL SECURITY
WELSH OFFICE



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Health Building Notes

Health Building Notes are intended for use in the briefing and design stages of projects to assist those concerned with the provision and design of new health buildings and the adaptation or extension of existing premises. The Notes contain information on the relevant aspects of current policy, the functional requirements and resultant design implications. They aim at encouraging economy in capital and revenue costs by consistency of provision, standards and equipment and the efficient use of space.

A flexible approach is adopted in the Notes. Optional solutions with cost implications are indicated, where appropriate, leaving local planners to make their own choice, having regard to overall cost limits. The general approach is to identify functions, activities, equipment needs and those dimensions which are critical to the efficient performance of an activity, but not to relate functions to specific or preconceived floor areas.

A feature of these Notes is the reference to Activity Data sheets which provide the detailed user requirements for each room or space.

To avoid repetition, guidance on spaces that commonly occur in health buildings has been brought together in a Health Building Note entitled *Common Activity Spaces* to which reference is made, where appropriate, in each Note. A draft of the *Common Activity Spaces* document has been made available to NHS Authorities.

The Notes are prepared in consultation with representatives from the NHS and appropriate professional bodies concerned with, or having a specific interest in, their content.

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1 General considerations

1.1 The guidance in this Health Building Note supersedes paragraphs (f), (g) and (h) on page 8 in Hospital Building Note 12 *Out-Patient Department,* covering the requirements of ophthalmic clinics.

1.2 The past decade has seen remarkable advances in the investigation and treatment of eye disease. A number of conditions regarded ten years ago as hopeless are now readily treatable. The majority of ophthalmic patients are treated as out patients and there has been a steady increase in the numbers of patients referred to hospital clinics. Some of these patients require specialised investigations in order to determine the correct treatment. These investigations may be undertaken by orthoptists, glaucoma technicians, medical photographers and others within the clinic, and by other departments such as the radiodiagnostic department or the pathology department. Because of the increased potential for surgical treatment of eye conditions the number of in patients has also risen.

1.3 The scale of the accommodation to be provided is dependent upon many factors. Of these, the extent to which the rooms can be planned to be used as fully as possible is of great importance. A thorough investigation of the likely workload in the clinics must be undertaken. If the projected workload shows that morning and afternoon clinic sessions are required every day of the week, then purpose designing for ophthalmology and no other specialty is justifiable. If fewer sessions are needed then use by other specialties must be considered. A clear brief for the designers should describe how alternative clinics will work in the same spaces but at different times. Adequate measures must be taken to protect ophthalmic equipment from accidental damage by other users.

1.4 Narrative descriptions of the way in which equipment is used in ophthalmic clinics cannot readily convey what is required to those unfamiliar with such work. It is strongly recommended that architects and others likely to be involved with a project should visit existing clinics identified by the medical members of the project team as good examples of modern up-to-date and acceptable practice. A glossary of terms is provided at Appendix I.

Inclusions

1.5 This Note contains guidance on the planning and design of the facilities required for an ophthalmic clinic within the out patient department of a hospital which also has an ophthalmic in patient unit, referred to later as a Main Clinic.

1.6 Much of the guidance will also apply to the planning and design of ophthalmic clinic facilities required within the out patient complex of a hospital which does not have the relevant in patient accommodation. In this instance, the clinic will almost certainly be available for use by other specialties and should be designed so that appropriate rooms can be used for other purposes.

Exclusions

1.7 The Note does not include guidance on the facilities required for a regional ophthalmic clinic or in patient accommodation requirements.

Purpose

1.8 The purpose of the ophthalmic clinic is the diagnosis and treatment of eye disease, including refractive work where appropriate.

Service background

1.9 General ophthalmology services are best planned on a multi-district basis and certain facilities, eg specialised diagnostic equipment or teaching facilities, will need to be provided on a sub-regional or regional basis.

1.10 There are three types of ophthalmic service described as Specialised (Type 1), Main (Type 2) and Satellite (Type 3). Descriptions of these services follow;

a. Specialised (Type 1): Regional or University Centres serving the specialised ophthalmic needs of one to three million people. There should be ophthalmic in patient accommodation with out patient facilities. No guidance is given for this type of service because of its special nature and comparative rarity of provision, but the information provided will assist in compiling a brief when required.

b. Main (Type 2): This should serve a population of about 500,000 and should provide ophthalmic in patient accommodation and out patient facilities. In areas with a low density of population it may be necessary to have a unit serving a smaller number. Guidance is given for the out patient clinic.

c. Satellite (Type 3): This should provide out patient facilities only, and will be available at district general hospitals, excluding those with a Main (Type 2) unit or where there are several such hospitals in close association. This guidance, which relates solely to the out patient facilities for the main service, can be used for assessing the accommodation needs for a satellite service.

1.11 The ophthalmic in patient beds needed for a defined population should normally be provided in one hospital in a viable nursing section. The practice of providing the beds in small numbers in several hospitals is unsatisfactory and

should be avoided. In practice, single districts may need to make arrangements with a neighbouring authority. All ophthalmologists may expect to have beds and out patient facilities in a main unit.

1.12 Main units will provide those services which are not available in their associated satellite units.

1.13 The workload in satellite units may need to be adjusted where practicable so that a consultant, apart from his duties in a main unit, works only in one other satellite unit.

Statistics and workload

1.14 The statistical data provided relates to the information available in the Department for the year ended 1979 and shows that in 1979, 94,978 clinic sessions were held in ophthalmology in England. At these sessions 523,689 new out patients were seen and there were 2,019,270 repeat visits, giving a total of 2,542,959 visits. Thus there are about four repeat visits for every new patient. Out patient attendances at orthoptic departments in 1979 were about 99,675 new patients, with 664,591 repeat visits, giving a total of 764,266 attendances.

1.15 Medical staffing in ophthalmology for England in 1979 was:

Consultants and SHMOs with allowance	320.9 (whole time)
SHMOs without allowance and Medical Assistants	65.1 (w/te)
Senior Registrars	78.0 (w/te)
Registrars	106.8 (w/te)
SMOs and HOs	272.0 (w/te)

1.16 These figures lead to the following general conclusions:

a. A fully trained doctor can see an average of 3 new and 12 repeat visit patients in one clinic session. It should be noted that because of study leave, annual leave etc, doctors will staff only about 80% of the clinics allocated to them. Allowance for this needs to be made in the calculations.

b. On a population basis it is expected that there will be about 90 specialised and main units overall in England, the majority of which will be main units. Each of these units might carry out up to 500 clinic sessions a year if occupied as often as is practicable. This implies that at least half of the clinic sessions will be held in satellite units.

1.17 The tendency is for clinics to get larger and to be held in fewer places. There is an increasing need for specialist clinics, eg retinal, diabetic, or glaucoma clinics, in main units. Patients at these clinics require much more doctor time and plans should be based on 5 to 8 patient visits per doctor per session. It is up to each Health Authority to decide the number of doctors, clinics and consulting rooms required.

1.18 Similar detailed calculations to those indicated in paragraphs 1.15 and 1.16 can be made for opticians and orthoptists if necessary.

1.19 For England in 1979 the average number of out patient attendances in ophthalmology was 54.8 per thousand population. A main unit would be dealing with about 27,500 out patient attendances per year and would need to be planned and designed to deal with these attendances, and modified as necessary to deal with local circumstances. It should be noted that the present range of attendances in all clinics is from 10,000 to 32,000 out patient attendances a year over the country.

General relationships and environment

1.20 The ophthalmic clinic accommodation should form part of the out patient department. It should be situated on the ground floor near the main entrance and the out patient department general reception point, thus avoiding the need for elderly and partially-sighted patients having to move too far into the out patient complex. A separate entrance to the ophthalmic clinic from the outside is not required but ophthalmic patients should not have to pass through other clinic areas to reach the ophthalmic clinic.

1.21 As far as practicable the aim should be to site the clinic so that consulting rooms and rooms for opticians and orthoptists receive as little direct sunshine as possible but full use should be made of natural daylight and ventilation.

1.22 There is an increasing tendency for ophthalmologists to hold joint clinics with various medical specialties such as neurology, diabetes and hypertension; such arrangements are likely to be in the best interests of patients. If possible, the routes between these various specialty clinics and the ophthalmic clinic should be kept clear, short and unobstructed. However, this must not override the basic requirements for the clinic to form part of the out patient department and to be near the children's clinic waiting area.

1.23 Additional ophthalmic clinic out patient accommodation should not be provided for children, who will use the same facilities as those for adults. The problems associated with mixing adults and children can be overcome by:

a. providing a children's waiting area, including a play space, separate from that provided for adults;

b. siting the ophthalmic clinic adjacent to the waiting area of the children's out patient accommodation;

c. holding separate clinic sessions for children;

d. holding children's clinics in the orthoptic area as done by some consultants: this would be by local agreement but obviously the normal working of the orthoptic area could not take place at the same time.

It should be remembered that small children, whether attending a clinic as patients or accompanying a brother or sister are unlikely to remain sitting still in a chair. They will run about and leave toys around which can create traffic and hazard problems. The separation of children's waiting from adult waiting is therefore important.

1.24 In order to rationalise the provision of waiting areas the out patient children's waiting area should also serve the ophthalmic clinic provided that it is adjacent. If such proximity cannot be planned then a separate children's waiting area is required in the ophthalmic clinic; this area should be adjacent to the orthoptic clinic area. For costing

purposes this Note assumes the provision of a separate children's waiting area within the ophthalmic clinic. (2.24)

1.25 The majority of ophthalmic out patients are elderly people and children, and account must be taken of the disabilities frequently found in elderly people, eg limited mobility and deafness. Signposting should be clear, well-lit and not placed too high. Complicated circulation routes must be avoided. Highly polished floor surfaces, even if coated with 'non-slip' polish, produce feelings of insecurity in older people. The use of soft floor coverings should be considered for the whole of the clinic except utilities, toilets and cleaners' rooms etc, and reference made to the *Report of the Floor Covering Study Group* issued to Health Authorities with HN(78)32. Steps and clear glass doors must be avoided.

1.26 The aim should be to achieve a relaxed environment consistent with clinical care needs. Careful selection of colour schemes and furnishings, especially in areas where children are waiting, can achieve this. Very bright colours and bold patterns in wallpapers should be avoided. Bold patterns on floor finishes should also be avoided as elderly patients in particular may mistake such patterns for solid obstructions or changes in floor levels.

Future expansion

1.27 The siting and planning of ophthalmic clinics should take account of the need for future expansion.

Teaching facilities

Undergraduate medical students

1.28 If it has been agreed that the teaching of undergraduate medical students will take place in the clinic, and their numbers necessitate additional space, this should be provided as part of the overall requirements for the out patient department. Reference should be made to the Department's DS letter 65/74 about teaching hospital space requirements issued on 22 March 1974.

Post graduate medical education

1.29 Although some education requiring special facilities will take place in a postgraduate medical centre or, in some instances, the hospital education centre, some teaching has to take place in the clinic. Apart from the use of seminar rooms no special facilities are normally required elsewhere in the hospital.

Statutory and other requirements

1.30 It is Government policy that health buildings should comply with the technical requirements of all relevant statutes and regulations even though the Crown need not always follow the procedural requirements of such legislation. Health buildings should also comply with all relevant codes of practice and standards. While this guidance as far as possible takes account of all statutory and other requirements in force at the time of writing, it does not relieve health authorities of the responsibility of ensuring compliance with statutes, regulations, codes and standards at all stages in their building projects.

Fire safety

1.31 At the time of writing Departmental guidance on all aspects of fire safety is being prepared in a series of documents within the Health Technical Memoranda series, commencing at number 81 (although publication may not be in strict numerical order). It is essential that project teams familiarise themselves with this guidance and the statutory regulations on the subject. In particular, the need for structural fire precautions and means of escape from the whole accommodation must be taken into account at the earliest possible planning stage. Guidance on fire safety as it applies to new health buildings and new parts of health buildings (eg extensions) is contained in HTM 81 *Fire Safety in Health Care Premises—Planning and Design of New Buildings* (a draft of this document has already been circulated within the NHS under the title *Fire Safety in New Health Buildings*).

1.32 It is important to establish those aspects of fire safety strategy which affect the design, configuration and structure of a project during the design stage. The designer should then verify his proposals with the chief fire prevention officer of the local fire authority from the inception of the scheme, and ensure that the project fire safety officer and all other planning staff are fully acquainted with the fire safety strategy for the design in operational terms (staff responsibilities etc), equipment provision, and building and engineering layouts.

1.33 The principles of fire safety apply to new projects and to alterations and upgrading of existing buildings. When altering or upgrading the aim should be to eliminate any existing fire risks.

Smoking

1.34 It is for individual authorities to make rules about smoking in health buildings under their control and management—see Departmental Health Circular HC(77)3 dated March 1977—but the general approach should be not to allow smoking except in specially designated areas. In such areas special attention may need to be given to ventilation needs to ensure that non-smokers who have to work or go into these areas are not excessively troubled and that offensive odours do not permeate to other non smoking areas of the premises.

Illustrations

1.35 The line drawings are intended to convey a general impression of the equipment used, details of which will of course vary from manufacturer to manufacturer.

2 Function and design

2.1 This chapter enlarges upon the objectives, functional requirements and design implications of a main unit situated within the hospital's main out patient department. The unit will contain the consultants' clinic, the orthoptists' and the opticians' clinics and appropriate support facilities. Full details of activities, equipment, environmental conditions, finishes of walls, floors and ceilings are given in the Activity Data sheets listed in Chapter 4.

2.2 The principles and the guidance provided in this chapter, adapted as necessary, can also be used for deciding the content of a satellite unit which will however be on a lesser scale than that of a main unit.

Economy

2.3 The design of the department must take account of the need for economy in all aspects including space provision, maintenance, staff utilisation and energy consumption. Whilst the overall capital expenditure must be kept in mind, it is equally important to ensure that running or revenue costs are kept to a minimum and that the revenue consequences of project decisions are fully considered. A booklet entitled *Note on the relationship between planning health buildings and the cost of running them,* issued in September 1980 with HN(80)29, should be of interest to design teams.

2.4 The amount of space for a service or group of services should be no more than is currently needed. Planning should ensure that spaces provided are not duplicated and that they are used as intensively as possible. Correct working relationships will help to facilitate economy.

2.5 Materials and finishes should be selected to minimise maintenance costs (including cleaning costs) and be compatible with the functional requirements. Assemblies which require frequent redecoration or are difficult to service should be avoided. The design of components which are subject to heavy usage such as entrance doors, corners on partitions and counters should receive special consideration. In particular, floor finishes should be restricted in variety and, where soft floor coverings are specified, should have a backing impervious to fluids.

Damage in health buildings

2.6 When designing and equipping health buildings the likely occurrence and effects of accidental damage should be considered. In particular, damage in health buildings has increased through the use of heavier mechanical equipment for the movement of patients and supplies and, to some extent, by the use of lightweight, often less robust, building materials. Reference should be made to the relevant British Standards and to the advice given in the Department's DS (Supply) letter 42/75 dated 5 August 1975 about the buffering of movable equipment.

Security

2.7 Security will normally be a matter of whole hospital policy. Wherever supplies such as drugs, instruments, cleaning materials etc are stored, precautions against theft will be required, eg cupboards may need lockable doors, windows may have to be barred and, in certain circumstances, there may be a requirement for audio/visual alarms.

Critical dimensions

2.8 The figures in Appendix II contain information on critical dimensions for some of the activities mentioned in the Note which are not included in the *Common Activity Spaces* Health Building Note. (At the time of writing a draft of this Note has been made available to the NHS.)

Health equipment note

2.9 Guidance on equipment for an ophthalmic clinic is contained in Health Equipment Note 39 *Ophthalmic Clinic* which should be used in conjunction with this Note.

Purpose of accommodation

2.10 The purpose of an ophthalmic out patient clinic is to provide facilities for the investigation and treatment of patients of all ages as hospital out patients. The essential functions are:

a. the reception of patients and escorts;

b. the examination of patients by consultants, other medical staff, orthoptists and ophthalmic opticians;

c. the treatment of patients;

d. instruction of ophthalmic staff in training;

e. the use of the services of a dispensing optician where available.

Room relationships

2.11 It is essential to design the room relationships so that those members of staff who work together in a team should have their rooms closely grouped and patients should not have to walk far between waiting areas and consulting and treatment facilities. Accommodation for orthoptists should be positioned so that there is a suitable external distant view (ie unobstructed by courtyards) for visual tests. The traffic routes to be taken by staff and patients should be carefully considered. Staff should be

able to move freely between consulting and treatment rooms without having to pass waiting patients. Patients using the main services should not have to go further into the clinic than necessary.

Internal spaces

2.12 Internal rooms may contribute to economy in planning but the resultant additional artificial lighting and ventilation which may be necessary will add to both capital and revenue costs. Internal rooms are not conducive to good working conditions and should be limited to supporting service rooms or those spaces which are either infrequently occupied or demand a controlled environment. Rooms that are likely to be occupied for any length of time by staff or patients should have windows. It should be noted that most clinical rooms in ophthalmology require blackout facilities over windows thus creating a ventilation problem even when the rooms are on an outside wall.

Organisation and workflow

2.13 Figures 1 and 2 illustrate the movements of patients and planning relationships within the ophthalmic clinic.

2.14 On arrival at the main out patient department reception desk, patients will be directed to the ophthalmic clinic. Provided that the workload can be forecast with reasonable confidence, it is best to arrange for patients to proceed directly to the ophthalmic clinic without any preliminary waiting for documentation at main reception.

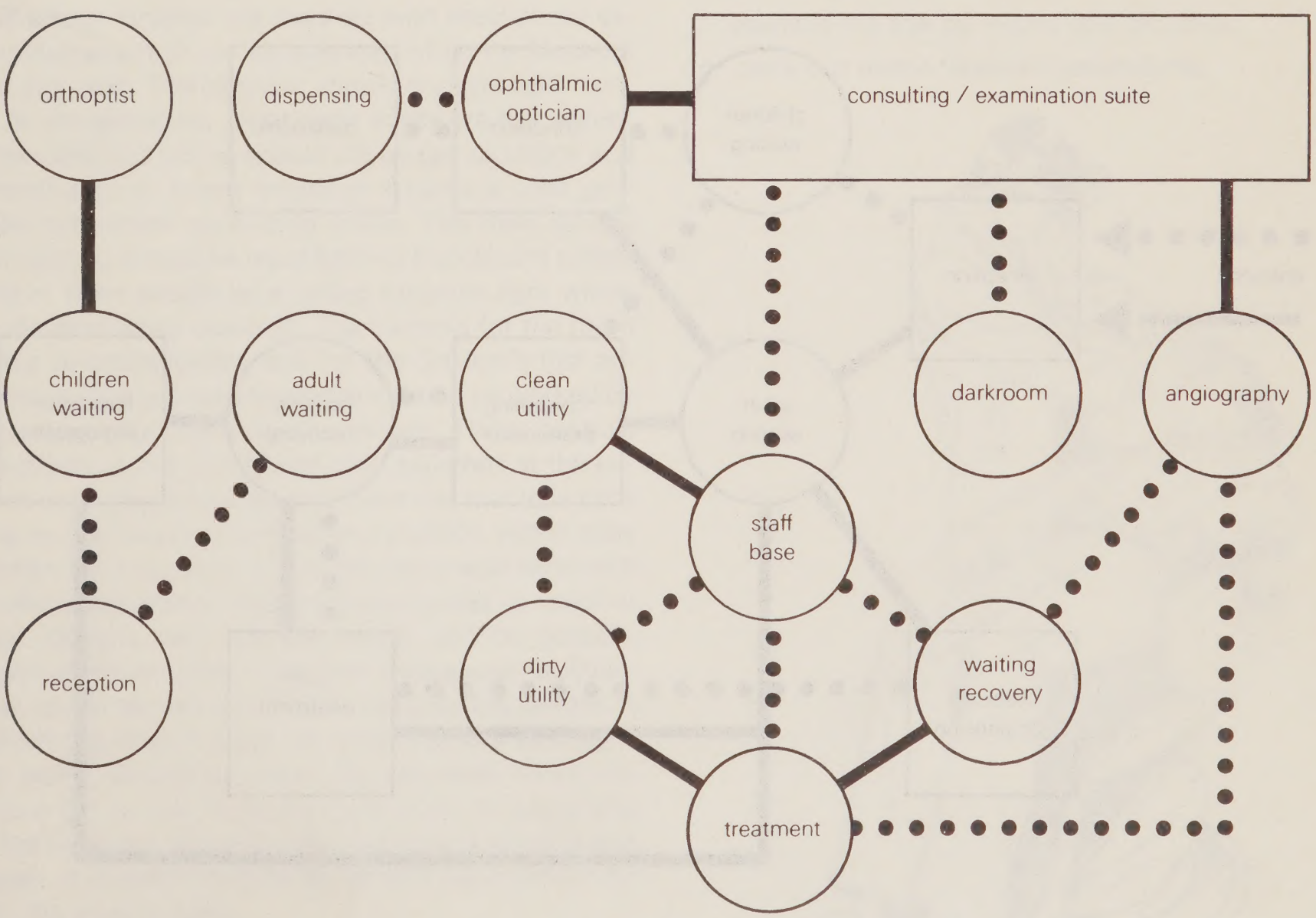
2.15 If the workload of a main unit, (and the separate elements within it) justifies it, a reception point serving only the ophthalmic clinic should be provided. In a main unit, sessions may be held morning and afternoon daily from Monday to Friday. In a satellite unit, which may have ophthalmic sessions for part of a week, the reception facilities would be more economically provided if they could be arranged to serve adjoining clinics as well.

2.16 Elderly patients and children are usually accompanied by escorts and allowance should be made for this when considering the size of waiting spaces. Child patients may be accompanied by both parents and by siblings. Patients and escorts should not be seated immediately outside consulting room doors as this may impede the movement of doctors and patients. Conversations within the consulting room may be overheard if patients are close to the doors.

Fluorescein angiography

2.17 There will be a need for fluorescein angiography facilities (which take specialised photographs of the eye) to be provided at main units.

Figure 1 Planning relationships



Social workers

2.18 Accommodation for social workers is not provided as part of the clinic. The need for such accommodation will be considered as part of the requirements for the out patient department as a whole. It would be reasonable however to site any facilities for social workers so that there is convenient access from the clinic particularly for elderly patients.

Functional and design requirements

Reception

2.19 A reception desk should be sited at the entrance to the clinic. All patients will report here on arrival and be directed to the clinic waiting areas. The receptionist should have direct observation of the waiting areas. The desk should be clearly signposted with large lettering at eye level and its design should include a screened part so that patients can discuss confidential matters in privacy.

2.20 The policy of holding patients' records varies from hospital to hospital but in most cases records are not held within the clinic. This Note assumes that patients' records will be returned to the medical records section at the end of each clinic session.

Administration office

2.21 A general administration area for the receipt, holding and distribution of patients' records for each clinic session is required. For more information on this space refer to *Common Activity Spaces* Health Building Note.

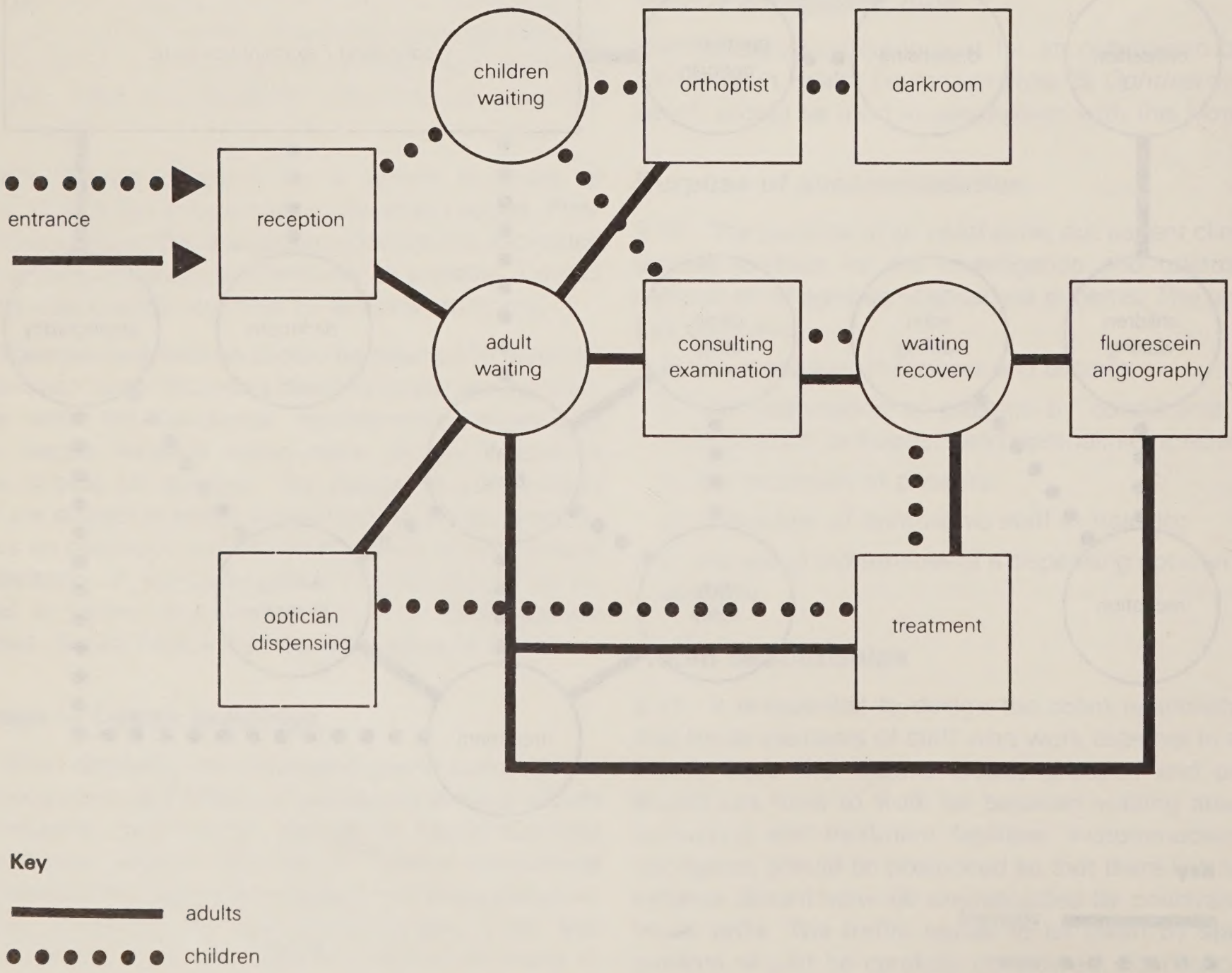
Waiting areas

2.22 The waiting areas for the clinic will accommodate patients and escorts attending the consulting element of the clinic. Not all patients will be attending for consultation; some will be attending for treatment; some to see the optician or orthoptist; and some to undergo fluorescein angiography or other procedures. The waiting areas should be planned as discrete spaces and should not form part of the clinic circulation space. A variety of seats should be provided both with and without arms including some suitable for elderly patients. Where planning permits full use should be made of natural daylight and ventilation.

2.23 The size of the waiting area should be assessed on the basis of the forecast workload and assumes an appointments system is in operation. The number of patients attending to see the doctor (1.16) will need to be increased by those attending for other purposes, eg to see the orthoptist or optician, and by the extent to which any local factors are likely to vary the workload. Experience indicates that it can be anticipated that at least 80% of patients will be escorted.

2.24 A separate waiting area should be set aside for children adjacent to the orthoptic clinic area. This area should be screened from the adult waiting area and space pro-

Figure 2 Movements of patients within the clinic



vided for a play area in which young children can run about. Some play equipment will be needed. Marker boards at low levels help to protect wall finishes. Soft floor covering should be provided. (1.25)

2.25 If the alternative arrangements described for children's waiting can be effected (1.23) some reduction in its size should be possible with a corresponding increase in the children's out patient department waiting area.

Consulting/examination suite

2.26 Statistics indicate (1.14 – 1.19) that for each clinic session there may be up to three doctors, including one or more doctors of the medical assistant and clinical assistant grades working in the clinic, and occasionally up to six doctors. In main units, where sessions are likely to be held throughout the working week, each doctor should have his own consulting space designed and equipped specifically for ophthalmology.

2.27 The rooms will differ in content from those provided in the general out patient department. Patients rarely have to undress for a full lying-down examination, and thus a couch with curtain screening should not normally be provided. (2.32) The couch in the clinic treatment room can be used on the occasions a full examination is necessary. The consulting spaces should be planned adjacent to one another and designed for ease of movement of staff between them and be provided with communicating doors, if appropriate. The ophthalmic opticians' room and the fluorescein angiography room should both be adjacent to the suite. The dark room and the treatment room should also be nearby.

2.28 Blackout facilities are required with mechanical extract ventilation which can be operated when the blackout facilities are used. The blackout should exclude light completely at the windows. Light-tight doors are not necessary. The walls and ceiling should not be painted black and the decorations can follow whatever scheme is used generally for out patient consulting suites. The main source of room lighting should be rapid lighting fluorescent tubes. In addition, there should be a ceiling tungsten light which can be dimmed when required. The controls for the room lights, the dimming facility and for the Snellen's test apparatus should be grouped to enable them to be worked by the consultant when close by the patient. These controls are in addition to the usual room light switches at the entrance. It is usually convenient to have the trial lens case standing on the working surface in a position within easy reach when the consultant is carrying out visual tests with the Snellen's apparatus. Some doctors prefer to work in subdued daylight, and curtains which can be partially drawn should be provided in addition to blackout facilities. Venetian blinds are not acceptable because the beams of light which can filter through the slats interfere with ophthalmic work. Windows should be openable when the blackout is not in use. As doctors will move to supporting rooms (eg dark room or treatment room) with patients and back again, it is undesirable for routes to these rooms to be close to the waiting areas.

Procedures and equipment

2.29 The first part of a consultation with a new patient will consist of personal history taking and a desk will be required for note taking. The patient will often be accompanied. To minimise movements from place to place, each consulting room should be equipped for all appropriate eye examination procedures using sight testing apparatus, a slit lamp and sometimes a wall-mounted Bjerrum screen for simple visual field tests etc. Indirect ophthalmoscopy examinations, especially where retinal clinics are held, require the patient to be in a supine position. A couch can be used for this purpose but elderly patients have difficulty in positioning themselves on a couch and usually require assistance. If the distribution of equipment and the arrangements made for the various methods of examination and treatment are such that both the patient and the doctor have to keep changing their positions, the throughput of the clinic will be slowed down considerably. This Note assumes the use of a tilting treatment chair which can overcome this problem provided it is correctly and semi-permanently positioned in relation to the equipment to be used.

2.30 With the patient seated in a tilting treatment chair throughout the consultation it should be possible to:

a. take the patient's history;

b. undertake refractions using the reverse Snellen's test apparatus with a mirror;

c. examine the eye using a hand-held ophthalmoscope;

d. carry out visual field tests with a one metre Bjerrum screen when provided (if the screen is wall-mounted behind or beside the patient, it is a simple matter to revolve the chair until the patient faces the screen);

e. carry out indirect ophthalmoscopy examinations with the patient in a supine position;

f. examine the eye by means of a slit lamp;

g. carry out minor treatment procedures.

Tilting Treatment Chair

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2.31 The use of the slit lamp can be effected by arranging for it to be mounted on a cantilevered shelf attached to a sturdy mobile stand or, preferably, on a specially constructed table. The slit lamp may then be swung across the patient's lap when seated upright and the doctor can be seated on a stool in front of the lamp. Ancillary equipment should be kept close to the lamp to enable further investigations to be carried out with the minimum of inconvenience.

Slit Lamp

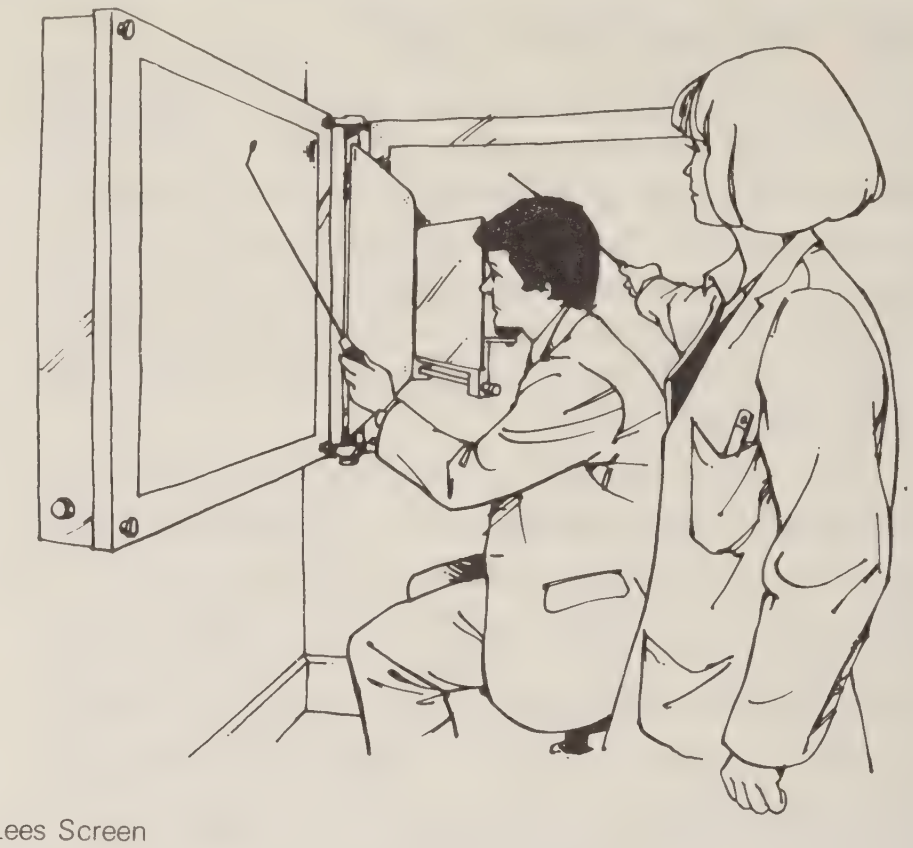
2.32 This Note recommends the use of a tilting chair but, if there are strong reasons for not using it in the manner described, indirect ophthalmoscopy examinations will need to be carried out on a couch. As patients need to be approached from both sides of the head and from above the head, the couch must stand away from the wall. It is probably not practicable to provide a couch in a separate room for shared use in view of the time taken for the patient and doctor to move from one room to another, and the possibility of delay if the couch is already in use. Thus a couch would be required in each consulting room. Space for this couch will increase the size and cost of each consulting room. However, some space could be saved by using a couch which can be placed against a wall when not in use.

Orthoptists' room

2.33 Orthoptic clinics are likely to be held morning and afternoon on each working day of the week. Patients will be attending either as part of a visit to the consultant's clinic or independently. The majority of patients will be small children accompanied by an adult. Only occasionally will there be more than three orthoptists in a main unit and more than one in a satellite unit. These figures are not intended to indicate staff complements which will be a matter for local decision.

2.34 The orthoptists' room will be used for a number of activities and should be zoned to enable these activities to be separated from each other. For some tests using the Snellen's test apparatus, a length of six metres is needed. For adults, the distance can be halved by use of a mirror but this arrangement is not acceptable to orthoptists when testing children. Orthoptists do not use a trial lens case in conjunction with the Snellen's test apparatus.

2.35 Other activities include (a) the use of a Hess wall-mounted screen with the patient seated in front of it, or a Lees screen which is fixed in a corner of the room as the two components of the screen must be at right angles to one another; (b) the use of a table-mounted instrument (synoptophore) with the patient seated in front of it; and (c) the use of hand-held instruments with the patient and orthoptist seated.



Lees Screen

2.36 Facilities are required for desk work, storage of orthoptic patient records and toys, and clinical hand-washing. Provision should be made to enable drawings and paintings provided by children to be displayed on wall-mounted pin boards. Furnishings and decorations should aim to achieve a domestic rather than a clinical character to the room. Orthoptists frequently kneel down beside children and a soft floor covering is therefore needed. (1.25) Windows should be positioned to give an external distant view which is necessary for some visual tests. Lighting levels should be adjustable.

Ophthalmic opticians' room

2.37 The ophthalmic opticians' room should be sited adjacent to the consulting rooms for easy communication with the ophthalmologists and be reasonably close to the waiting areas for both adults and children. The optician will carry out refractions using the three metre distance and a mirror, as in the consulting rooms. Trial lens cases will be used and space is needed for desk work, storage of equipment and opticians' records. Provision may be required for contact lens examination and fittings, if so a tilting treatment chair, slit lamp and keratometer will be needed. Blackout facilities are required with mechanical extract ventilation which can be operated when the blackout facilities are used. The room lighting should be the same as that in the consulting room with dimming controls for the tungsten lighting. There will be a need to provide storage for low vision aids both for testing purposes and for issuing on loan to patients.

Dark room

2.38 A dark room sited near to the consulting suite will be used mostly by the ophthalmologists to carry out visual

Synoptophore

field tests. The room will also be used occasionally by orthoptists and opticians. Various eye tests are performed here and a space will be needed for a patient to sit at least two metres from a permanently wall-mounted screen (Bjerrum screen). Visual field tests also involve the use of apparatus, eg a perimeter at which the patient sits and the operator stands alongside. The type of perimeter to be used is a matter for local decision. Usually two types are used; the size and dimensions of the room must therefore be capable of accommodating both a two metre screen and two perimeters. The Bjerrum screen should be accessible from both sides.

Perimeter

2.39 One dark room would be sufficient for up to four doctors and two rooms would be required where there are five or six doctors. To help in the smooth running of the clinic an 'in-use' light system should be employed and sited so that everyone can see at a glance whether the room is occupied or not. It is not necessary to have black painted walls and ceilings; light coloured surfaces avoid the claustrophobic effect normally found in a photographic dark room. Dimming controls similar to that in consulting rooms will be required.

Treatment room

2.40 The treatment room will be used for simple treatments such as minor surgery of the eyelid, washing out tear ducts, removal of superficial foreign bodies and for some tests that require a patient to lie down. A couch and a tilting treatment chair will be needed; the couch could also be used by other patients who require a full examination. This Note assumes that the items required for each procedure will be assembled on a dressing trolley in the clean utility and brought into the treatment room. Certain items such as adhesive tape, supplementary dressing packs and sutures can be stored on a trolley within the treatment room. Items for disposal should be bagged and removed after each procedure.

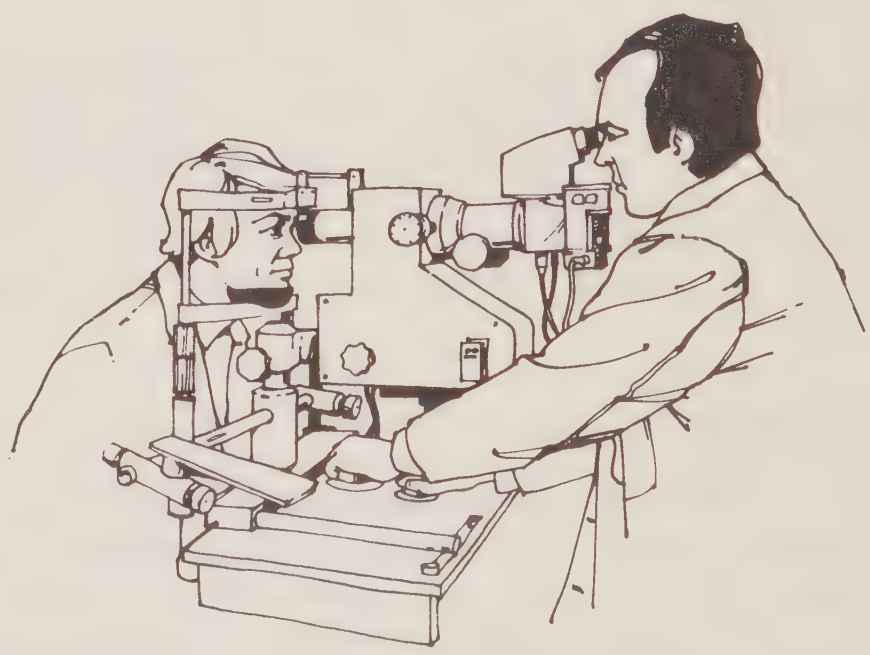
2.41 Blackout facilities are required with mechanical extract ventilation which can be operated when the blackout facilities are used. The main source of room lighting should be by fluorescent tubes. In addition, there should be a ceiling tungsten light which can be dimmed when required. For treatment procedures two ceiling-mounted luminaires will be required; a minor operating luminaire over the couch and an examination luminaire over the adjustable treatment chair. The electricity supply to the operating luminaire should be battery maintained. Filtered air should not be required. Clinical hand-washing facilities and a mirror for patients' use are needed. Shelving and ledges collect dust and must be avoided.

2.42 It is preferable that the treatment room should be an outside room. It should be adjacent to the recovery/waiting area and dirty utility and near to the staff base.

Fluorescein angiography room

2.43 A separate room will be required for fluorescein angiography which it is assumed will take place in the majority of main units. The room should be adjacent to the consulting/examination suite, but communicating doors to any other rooms are not necessary. The room should be near to the treatment room and the waiting/recovery area. It is likely that patients undergoing this procedure will be booked for a session separately from those attending for the ordinary consulting sessions.

2.44 The fundus camera which is mounted on a stand takes up space similar to that required for a slit lamp. The high-speed flash generator equipment used in fluorescein



Fundus Camera

angiography is bulky and adequate space for the equipment is needed. The patient and doctor will be seated on variable height stools with castors while the doctor takes the photographs. During the procedure the patient is given an injection. A couch must be provided for use in the unlikely event of a patient's collapse. Equipment for first stage resuscitation must be available and a method of summoning the cardiac arrest team should be provided. This provision can be via the staff to staff emergency call system within the department, or connected to other departments such as out patients, or directly through the internal telephone system. In addition to the fundus camera, a small desk, a clinical wash hand basin and a large storage cupboard for the patient's photographic records will be required. Provision, similar to that in consulting rooms, should be made for blackout, ventilation and dimming facilities.

2.45 Film should be developed in accordance with local policies.

Waiting/recovery area

2.46 Either preceding or following treatment/examination, patients will wait in a small area sited adjacent to the treatment room within sight of the staff base and within easy reach of the consulting rooms. Natural light is desirable and semi-easy chairs should be provided. There must be easy access to a WC. Some of the waiting patients will have had eye drops instilled which cause temporary blurring of vision and because of this, simple traffic routes are important and structural columns in the waiting space should be avoided if possible.

Dispensing optician's room/contact lens fitting room

2.47 Where it is intended to dispense spectacles a separate room near to the ophthalmic opticians' room will be required for the dispensing optician. The room should contain a fitting table, chairs, mirrors and storage space for frames and equipment for repairs and adjustments. If it is not intended that this function should be provided then consideration could be given to using the room for contact lens fitting. (2.37) Provision similar to that in consulting rooms should be made for blackout, ventilation and dimming facilities.

Staff base

2.48 The staff base should be provided adjacent to the clean utility. It should be near to the treatment room, dirty utility, and the consulting/examination suite and overlook the waiting/recovery area. Staff/staff emergency call indicators should terminate here in addition to the reception area and utility rooms. Desk space for one person is required.

Clean utility

2.49 The clean utility will be used for storing clean/sterile supplies and preparing trolleys for use in the treatment and consulting rooms. There should be space for storing sterile fluids, lotions and external applications and provision for the secure storage of drugs, including Controlled Drugs. Space for parking dressing/instrument trolleys is also required. The entrance to the clean utility should be adjacent to and under the direct observation of the staff base. It is assumed that sterile packs of ophthalmic instruments will normally be provided by the Hospital Sterilising and Disinfecting Unit, or Central Sterile Supply Department. Where local policy differs from this assumption and requires that ophthalmic instruments for use in the clinic are sterilised there, a small bench-mounted steriliser should be installed in the clean utility. The implication of handling instruments on open trays will need to be carefully considered.

Dirty utility

2.50 A dirty utility room near to clean utility is required for the disposal and cleaning of clinical equipment used in the clinic. Facilities are needed for the disposal of liquid waste; the cleaning of up to three trolleys at any one time; and the temporary holding of all materials requiring disposal or reprocessing. Some shelves for limited storage may be required. If urine testing facilities are not available nearby, provision for urine testing will be necessary here.

Patient WCs

2.51 A wheelchair WC should be provided adjacent to the treatment/waiting recovery area. If access to other WC facilities in the main out patient department is not convenient, up to two more WCs may be required within the clinic. For more information on this space refer to the *Common Activity Spaces* Health Building Note.

Staff changing and WC

2.52 It is assumed in this Note that female and male staff will use centralised staff changing. Accommodation should therefore be provided in the clinic or in adjacent out patients' accommodation for staff to hang coats, cloaks and keep valuables secure in small lockers. A WC and wash basin is required for staff use.

Cleaners' room

2.53 Local cleaning policies and the location of cleaners' rooms in the adjacent main out patient department will determine the need for a cleaners' room in the ophthalmic clinic. If a cleaners' room is required information on it will be found in the *Common Activities Spaces* Health Building Note.

Store

2.54 Whole hospital policies will determine the method of providing storage at departmental level but space will be required for items such as linen, disposables, stationery etc, in addition to that provided in cupboards within individual rooms.

Switchroom

2.55 This is required for housing the main isolator and distribution switch/fuse-gear for the clinic. The room should be kept dry and well ventilated and the door should be lockable and open outwards. To minimise the radial length of circuit wiring the switchroom should, whenever possible, be located centrally within the department.

3 Engineering services

3.1 This chapter describes the engineering services contained within this department and their integration with the engineering systems serving a whole site. Its purpose is not to inhibit the design solution but to acquaint the engineering members of the multi-disciplinary design team with the criteria adopted (in terms of material specification, design conditions and reference material) to meet the functional requirements.

3.2 Documents referred to by number viz[10] are listed at the end of the chapter. They are numbered in order of first appearance, repeated references retaining the same number.

Model specification

3.3 The library of standard specifications issued in the CS series of engineering data sheets is currently being updated and will be re-issued as a model specification for engineering services in health care buildings. The cost allowance for the engineering services in each functional unit of this department is based on qualities of material and workmanship described in the model specification.

Economy

3.4 Engineering services should be designed to obtain the optimum benefits from the capital invested. Where alternative design solutions are available their consequential capital and revenue costs should be compared using Present Worth techniques[1] due consideration being given to the need for access for maintenance and the replacement of plant and equipment.

3.5 Where design solutions related to economic assessment are indicated the cost of energy at the point of use should be used. The value of the heat conversion and distribution losses can, for buildings well dispersed on a site, equal that of the useful energy consumed.

3.6 In the interests of energy management, and where practicable, facilities should be provided at intake points to this department for the easy attachment of energy monitoring equipment, eg meters, thermometers etc.

Maximum demand

3.7 User demand on engineering services is often difficult to predict but experience indicates that services designed for simultaneous peak conditions are seldom fully utilised in practice. The estimated maximum demand and storage requirement (where appropriate) for each engineering service in this department will need to be assessed individually to take account of building shape, geographical location, operational policies and intensity of use. As a guide and for preliminary planning purposes only the following are the estimated peak demands for a 3 consultant ophthalmic out patient clinic.

Service	Typical maximum demand	Remarks
Heating, ventilation, DHWS	43 kW	
Domestic hot water	0.65 litre/sec	Storage 300 litre (2 hour recovery)
Cold water supply	0.80 litre/sec	Storage 2000 litre (24 hour supply)
Ventilation (supply)	0.73 m^3/sec	
Ventilation (extract)	0.73 m^3/sec	Clean and 'Dirty'
Electrical	17 kW	Essential 10 kW
Medical gases	No requirement	
Fuel gas	No requirement	
Steam	No requirement	

Plant rooms

3.8 Recommended spatial requirements for mechanical, electrical and public health engineering services in health buildings are given in HTM 23.[2] This information is specifically intended for use during the initial planning stages when precise dimensional details of plant are not available.

Activity data

3.9 User requirements, working conditions and arrangements, as exemplified in the Activity Data sheets, listed in Chapter 4 should be referred to when positioning service components and outlets. Patient operated equipment should be of the simplest pattern and suitable for users with impaired vision.

3.10 The distribution of mechanical and electrical services to final points of use should be concealed wherever possible employing a ceiling void and a 200 mm wide perimeter zone under window sills. Heat emitters should be contained within the latter and critical dimensions should be taken from the boundary of this zone. For costing purposes the 200 mm band which includes the floor area occupied by minor vertical engineering ducts is included in the building circulation provision.

Safety

3.11 Under Section 6 of the *Health and Safety at Work etc Act 1974* there is a statutory duty on designers to ensure (as far as is reasonably practicable) that articles installed or erected for use at work are safe and without risk to health and safety when properly used. Engineering components, eg pipework, terminals etc are covered by the term 'articles' and thus this duty applies to the designers of engineering services for non-domestic buildings.

Fire safety

3.12 Detailed recommendations for the fire protection of health buildings are given in HTM 81[3]* and the design of the engineering services should accord with these recommendations.

3.13 Recommendations concerning fire detection and alarm systems are given in HTM 82[4]* and BS 5839 Pt 1[5] but agreement with the chief officer of the local fire authority regarding means of detection, alarm and escape should be sought jointly by the engineer, architect and other interested parties during the early planning stages.

Noise

3.14 Excessive noise in individual areas, whether internally or externally generated and transmitted, can detract from the working of the department. The means of control advocated in Hospital Design Note 4[6] and Circular HN(76)126[7] and its Annex should provide an acceptable acoustic environment. Care is required to ensure that there is auditory privacy in consulting and treatment rooms particularly where these are located adjacent to public areas.

Control access

3.15 The location of engineering distribution control and isolation devices should allow easy access from circulation rather than working areas and they should be protected against unauthorised use, eg by concealing switch-gear and fuse-boards in discrete cupboards.

Mechanical services

3.16 The mechanical services include the provision of heating, ventilation, and hot and cold water supplies. For cost allowance purposes the distribution of these services is deemed to commence at their point of entry into the department (where isolation and facilities for the attachment of monitoring equipment should be provided) and includes pipework, fittings, controls and connections to equipment and outlets.

3.17 For environmental requirements in individual spaces reference should be made to the Activity Data sheets. Recommended room temperatures, air change rates, hot water service temperatures etc are grouped under 'Technical Design Data' on each 'A' sheet. The 'B' sheets give the disposition of engineering outlets for the activities described.

Heating

3.18 General space heating requirements can be met by low temperature hot water radiators operating as a subsystem from the main heating system. These should normally be placed under windows and against exposed walls, with sufficient clear space between the top of the radiator and the window sill to prevent curtains draping over the radiator and adequate space below to allow cleaning machinery to be used. Where a heater is located on an external wall, back insulation should be provided to limit the rate of heat transmission through the building fabric. Information regarding the construction of heat emitters including their mechanical and thermal characteristics, methods of mounting and fixing, variations in pipe connections, problems of cleaning and maintenance, means of manual control of output and aspects of safety are given in Engineering Data Sheet DN4.[8]

3.19 To facilitate overall temperature control the heating system should, if practicable, be zoned relative to each major elevation of the building and, where close individual room control is required, remote sensor thermostatic radiator valves may be used. These valves should be capable of operating to pre-set maximum and minimum temperature settings and should be tamper-proof. Thermostatic radiator valves with built-in sensors may give inadequate control when connected to a modulated heating system.

3.20 Heat emitters should have a maximum touch temperature of 82°C and the flow temperature should normally be controlled via an external compensator. Where space is restricted or heat gains and/or losses are particularly variable, consideration should be given to the provision of thermostatically controlled fan-convectors fitted with low-limit control.

3.21 Where practicable, the heating system in this department should be clock-controlled and programmed to accommodate the working hours of the unit. The control system, possibly incorporating an optimum-start device, should be used to set-back the space temperature to an anti-condensation level of the order of 10°C when the accommodation is closed (actual set-back to be determined from local trials). To allow for occasional abnormal hours of working, a conveniently sited manual override switch giving two hours additional operation, with visual indication, should be provided for use by authorised staff.

Ventilation

3.22 Recommendations for the ventilation of individual spaces in this department are shown on Activity Data 'A' sheets. Mechanical ventilation systems are expensive in terms of capital and revenue costs and planning solutions should be sought which take maximum advantage of natural ventilation.

3.23 Natural ventilation is primarily dependent on buoyancy (the difference in density between warm and cold air) and the effect of wind pressure. The buoyancy effect is important where the flow of air through the department is unduly impeded by internal partitioning or where there is a need to keep internal doors closed. If however, some open-planning of internal space is acceptable, cross-ventilation using the effect of wind pressure has the potential for creating higher air change rates particularly where the building can be located to take advantage of local wind patterns. Window design plays an important role in achieving adequate natural ventilation. The buoyancy effect is accentuated by increasing the vertical distance between air inlet and outlet (eg the vertical sliding sash) and seasonal control of ventilation requires opening lights that are fully adjustable between maximum and minimum to provide optimum air movement without prejudicing safety, security or comfort.

3.24 It is acknowledged that planning constraints imposed by the building shape and/or functional relation-

*In preparation

ships of specific spaces will invariably result in some measure of deep-planning. Ventilation costs can however be minimised by ensuring that, wherever practicable, core areas are reserved for:

a. rooms that require mechanical ventilation irrespective of their location (internal or peripheral). Examples are: sanitary facilities, dirty utility, dark rooms, and rooms whose clinical or functional requirements have specific environmental needs and where for reasons of privacy and absence of solar gain etc, windowless accommodation is acceptable.

b. spaces which have only transient occupation and therefore require little or no mechanical ventilation. Examples are circulation and storage areas.

3.25 Air movement induced by mechanical ventilation should be from clean to dirty areas where these can be defined and diffusers and grilles should be located to avoid stagnant pockets of air occurring in areas remote from windows. The design should allow for an adequate flow of air into any space having only mechanical extract using transfer grilles (light proof where necessary) in doors or walls to connect such spaces to corridors. Such arrangements however should avoid the introduction of untempered air and should not prejudice the requirements of fire safety or visual and acoustic privacy.

3.26 A separate extract system will be required for 'dirty' areas, eg utility and sanitary facilities and a dual motor/fan unit with an automatic changeover facility should be provided to ensure that these rooms are always maintained at a negative pressure when the unit is in use.

3.27 Locally controlled extract ventilation will be required in the dark room and in all rooms provided with blackout facilities. Where such spaces (treatment room excepted) are located on the perimeter of the building a through-the-wall centrifugal extract fan, fitted with a black lightproof exterior cowl and sized to provide a nominal five air changes/hour, should be adequate to compensate for the lack of natural ventilation when blackout facilities are in use. Similar accommodation located in core areas and the treatment room irrespective of location will require a ducted extract system.

3.28 External discharge arrangements for extract systems should be protected against back pressure from the prevailing wind and located to discharge clear of air inlet points and windows.

3.29 With the probability that many of the individual extract systems will be in simultaneous use it will usually be necessary to provide a supply air system to supplement infiltration. The fresh air supply should be tempered and filtered before being introduced into circulation/waiting areas via high level diffusers designed to avoid the creation of draughts.

3.30 Ventilation supply plant for the department should include air filters of 95% efficiency against BS 2831[9] Test Dust No. 2. To reduce the frequency of replacement of filters where the incoming air is exceptionally polluted, it may be desirable to include additional coarse pre-filters. Filters must be readily accessible for replacement and maintenance purposes and provided with a pressure-differential indicator.

3.31 Where deep-planning of continuously occupied spaces is unavoidable there will be occasions when acceptable levels of comfort can only be maintained by air-cooling. Planning solutions of this type will be exceptional and no provision for cooling plant has been included in the cost allowance. Where the facility is required the plant capacity should be limited to that necessary to maintain an internal temperature of 25°C when the external ambient is 28°C.

3.32 Supply and extract ventilation systems should include local controls and indicator lamps to confirm the operational status of each system. Where the use of the system is on a regular daily pattern, a time-switch control with manual override should be considered. For individual units, eg extract fans, the indicator may be located in the control switch. Where a system is provided for a particular space the indicator should be in, or immediately adjacent to that space and, in the case of a more general system of ventilation, eg core areas, the indicator should preferably be located at the staff base. Where manual controls are available for staff use they should be provided with labels clearly defining their function.

Hot, cold and drinking water services

3.33 The domestic hot water should be stored at a temperature of 60°C and distributed from a local calorifier installation at a temperature not less than 50°C. Outlet fittings for wash basins, sinks and shower are shown on Activity Data 'B' sheets.

3.34 Guidance concerning the design and installation of cold water supply pipework and distribution systems is given in HTM 27.[10] For frost protection purposes and to prevent condensation staining decorative finishes all cold water pipework, valves and flanges should be insulated.

3.35 Unless all cold water outlets are supplied from protected tanks, a mains fed drinking water outlet should be provided in the clean utility.

Fire-fighting equipment

3.36 Fire-fighting equipment should consist of hydraulic hose-reels and portable fire extinguishers, and should be positioned so that adequate cover is given to the whole interior of the department. Hose-reels, in accordance with BS 5306 Part 1[11] and usually with 30 m of hose, should be located so that the jet of water from the fully extended hose is capable of reaching every point on the floor area without interruption after due allowance is made for furniture and fittings. Overlapping of cover by hose-reels is preferred to the provision of additional nine litre water extinguishers, except that a nine litre water extinguisher should be provided to cover small isolated areas not exceeding 200 m^2 and not otherwise covered by a hose-reel. Carbon dioxide extinguishers should be provided to cover electrical risks but for other risks, eg ignited liquid or gas, either carbon dioxide or dry powder extinguishers are appropriate. Extinguishers should comply with BS 5423[12] and further guidance concerning their selection and use is given in HTM 81 referred to in paragraph 3.12.

Piped medical gases and vacuum

3.37 There is no requirement for these services in this department. A mobile oxygen trolley and portable medical

vacuum apparatus for emergency use should be conveniently located in an adjacent department, eg out patient department.

Electrical services

3.38 The electrical installation will include main intake switchgear and wiring and equipment for lighting, power, and environmental plant. Extensions from the hospital central systems for telephones, fire alarms and staff location services, together with separate call systems, will also be required. These installations should comply in all respects with the current *Regulations for Electrical Installations*[13] and conform to the requirements of HTM 7.[14]

3.39 Reference should be made to the Activity Data sheets for the recommended levels of internal illumination, disposition of outlets for power, telephones, call systems, and clocks etc in individual spaces.

3.40 The point of entry for the electrical supply will be a departmental switchroom housing the main isolators (with provision for metering) and the main distribution equipment. The switchroom will also be the distribution centre for subsidiary electrical services and, wherever possible, all equipment should be mounted at a height to give easy access from a standing position. The whole installation should be positioned within the department so as to minimise the cost of cabling required to serve the department.

Electrical installation

3.41 The electrical installation in occupied areas should be concealed using PVC insulated cable in screwed steel conduit or trunking. External installations or any part within the building subject to external conditions, eg ventilated roof space, should comprise PVC insulated cables in galvanised screwed steel conduit with fittings of weatherproof pattern. Wiring ways for the telephone system should be provided in accordance with extension requirements.

Electrical interference

3.42 Guidance concerning the avoidance and abatement of electrical interference is given in HTM14.[15] Dimming of room lighting will be extensively used in this department and care should be taken to avoid mains-borne electrical radio frequency interference affecting electro-medical equipment used elsewhere in the hospital. All dimming devices should comply with the latest issue of BS800.[16]

Lighting

3.43 Practical methods of lighting the various functional spaces are contained in the CIBS Lighting Guide[17] and the choice of luminaire (lighting fitting) should take account of the requirements of light distribution, and visual comfort appropriate to the space. Luminaires should be of a type which are easily cleaned and maintained. Their location should be readily accessible for lamp changing and maintenance, but with the overriding requirements that (a) the required standard of illumination is provided at the point of work, and (b) three-dimensional definition is provided to emphasize any areas likely to be hazardous to patients with poor vision. Luminaires using fluorescent lamps should be installed when artificial lighting is required for long periods or where areas are devoid of natural light; intermittently used luminaires may be more economically fitted with tungsten lamps.

3.44 It is essential that fluorescent lighting in clinical areas is derived from one of the recommended types of lamps having suitable colour rendering characteristics.[18] In such areas the colours chosen for walls, floors and ceilings should be carefully selected; architects and engineers should collaborate to ensure that the decorative finishes are compatible with the colour rendering properties of the lamp and that spectral distribution of the light source is not unduly altered.

3.45 In rooms where blackout facilities are occasionally used fluorescent luminaires should incorporate controlgear that gives fast and stable operation. Where subdued lighting is also required a separate centrally located tungsten luminaire controlled by a variable voltage device is preferable to dimming the general lighting. In the consulting/examination, optician's and orthoptists' rooms the general lighting should be two-way switched at the entrance door and the clinician's desk. The tungsten dimming facility should also be controlled from the desk.

3.46 Where acceptable daylight factors in perimeter rooms cannot be achieved, eg owing to obstruction from an adjacent building, it will be necessary to provide supplementary artificial lighting of sufficient intensity to balance and blend with the available daylight. Lighting designed to these higher standards of illumination should avoid excessive contrast with adjacent areas. It is recommended that this additional illumination is provided by multi-lamp luminaires and their output varied by locally switching part of the light source in each luminaire.

Treatment room

3.47 A ceiling-mounted minor operating luminaire should be located above the couch and an examination luminaire similarly installed above the treatment chair. The lamp housings of both fittings should be fully enclosed with suspensions that allow the beam to be directed locally. The luminaires should provide reasonably shadow-free illumination with negligible heat development. Recommended illuminances are 5000 lux from the operating luminaire, 1000 lux from the examination luminaire and a general illumination of 400 lux for the performance of ancillary tasks.

Corridor lighting

3.48 The lighting of corridors and circulation areas, which generally are areas not covered by Activity Data sheets, should be to an average level of 150 lux, measured at floor level, and should also comply with colour rendering and glare limitations. Mounting luminaires longitudinally along a corridor, centrally, or to one side to assist compliance with glare limitations is acceptable, as also is the occasional transverse luminaire to mark major corridor junctions or unavoidable changes in floor level.

Other lighting

3.49 The remaining lighting in the department should be

to the levels shown on the Activity Data sheets with luminaires located and fluorescent luminaires oriented, where appropriate, to achieve task illumination. Because of the significant effect of lighting on interior design and amenity the final choice of luminaire should be acceptable to both the architect and engineer.

Controlled Drugs cupboard

3.50 In compliance with the relevant section of BS 2881[19] a red indicating lamp should be provided on each Controlled Drugs cupboard, with parallel indicating lamps where appropriate at the doorway to the room in which the cupboard is located, the corresponding staff base, and after hours, in a continuously manned area outwith the department. The lamps should be interlocked with the cupboard to give visual indication when the cupboard is unlocked and should be supplied from an essential circuit.

Illuminated signs

3.51 An 'in-use' warning sign for each work station should be ceiling-mounted in a conspicuous position outside the entrance to the darkroom and switched from within.

Socket-outlets

3.52 Sufficient 13 amp universal type switched, shuttered socket-outlets, connected to ring or spur circuits should be provided to allow all portable appliances likely to be used simultaneously to be individually supplied. Activity Data sheets indicate specific locations for the outlets associated with individual activities; the installation of twin-outlets should be considered where specific activities occur in juxtaposition.

3.53 Domestic cleaning appliances with flexible leads nine metres long should be assumed and socket-outlets, usually in corridors, should be provided to enable such machines to operate over the whole area of the space concerned.

3.54 Fixed appliances rated up to 13 amps should be permanently connected to spur boxes and fused as required. Appliances rated in excess of this load, or those requiring a three-phase supply, should be permanently connected to separate final sub-circuits from fuse-boards and independently switched.

3.55 Switches or other means of isolation should be provided adjacent to electrical machinery and plant to ensure the safety of operators and maintenance staff.

3.56 Electro-medical apparatus, heating appliances and automatically operated equipment should be provided with indicator lights to show when the equipment is energised. Such indicators should be incorporated in the control panel of the apparatus, in the control switch, or in the socket-outlet from which the apparatus derives its supply.

X-ray equipment

3.57 The use of portable X-ray equipment is not anticipated and the mains impedance criteria specified in HTM7[13] for socket-outlets are not applicable to this clinic.

Emergency electrical supplies

3.58 Guidance concerning the provision of emergency electricity supplies is given in HTM11.[20]

3.59 The installation in the treatment room should be so arranged that in the event of a supply failure the operating luminaire is battery-maintained until the standby generator supply is available.

3.60 Socket-outlets should be so distributed that, in each area where essential equipment may be used, socket-outlets connected to at least two separate sub-circuits are available. In this department all socket-outlets in the treatment and clinician rooms should be connected to the essential electricity supply system.

Patient/staff call system

3.61 Call points should be located in patient toilet accommodation and should consist of a push-button, reassurance light and reset switch. A visual and audible indication of operation should be provided at the staff-base and reception desk to give responding staff unambiguous identification of the call source. The call system should also include staff/staff call facilities from patient toilets, treatment room, fluorescein angiography room and all clinician rooms. Further guidance is given in HTM15.[21] Hospital policy may also require a staff/staff emergency alarm to be repeated in an adjacent department or transferred to a centrally manned point.

Next-patient call system

3.62 Some clinicians may prefer to call their patients personally but generally a simple and unobtrusive visual call system will be required. This should comprise an illuminated indicator panel and warning buzzer of subdued tone located at the reception desk.

Staff location system

3.63 The staff location system employed in the hospital should be extended to give adequate cover to this department. Guidance on these systems is given in HTM20.[22]

Telephones

3.64 Central telephone facilities for internal calls and external calls, either in separate or combined form, will normally be available and extensions from this system will serve this department. Telephones will normally be of the desk pattern but in recovery areas, or adjacent to them, they should be fitted with an indicating call-light and a bell or buzzer of subdued tone.

Electric clocks

3.65 Clocks may operate in conjunction with a master clock system or be synchronous units supplied from a local lighting circuit, whichever is consistent with the remainder of the hospital. The number of clocks provided should be kept to the minimum and they should be installed only where they can be viewed by numbers of staff/patients/visitors. Clock face designs should be suitable for patients with limited vision.

Fire alarm and detecting system

3.66 In general a 2-wire monitored open-circuit system which allows the connection of break-glass call points and automatic detectors (if required) is recommended. The choice of detectors is a complex matter and is dealt with in the guidance already mentioned in paragraph 3.13. With the exception of the treatment room (visual alarm) audible signals will normally be adequate but it should be noted that sound levels require checking for audibility after full occupancy of the building and after any automatic door detentes have been released.

Lightning protection

3.67 Protection against lightning should be provided in accordance with BS Code of Practice 326[23] and HSE Data Sheet DB2.1.[24]

Internal drainage

3.68 The primary objective is to provide an internal drainage system that uses the minimum of pipework and

a. remains water and air-tight

b. remains free-flowing with the minimum of maintenance

c. is quiet in operation.

3.69 General design guidance is given in the relevant British Standards and Codes of Practice including BS5572 —formerly CP304[25]—and the current Building Regulations. Recommendations regarding spatial and access requirements for public health engineering services are given in HSE Data Sheet EA5.[26]

3.70 The gradient of branch drains should be uniform and adequate to convey the maximum discharge to the stack without blockage. Practical considerations such as available angles of bends/junctions and their assembly, as well as spatial considerations, usually limit the minimum gradient to about 1:50 (20 mm/m). For the larger pipes, eg 100 mm diameter, flatter gradients can be used but require workmanship of a high standard if adequate self-cleansing flow is to be maintained. It is not envisaged that pipes larger than 100 mm diameter will be required within interfloor or ground floor systems serving this department.

3.71 The drainage system design should include adequate ventilation to relieve accumulation of foul air and to maintain the hydraulic performance of the system, eg the integrity of trap water seals.

3.72 The materials specified for the drainage system in this department will depend upon their location and the nature of the effluent being discharged. Although adequate for the drainage requirements UPVC may not always be acceptable to the fire officers and neither should it be installed above 'sensitive' areas, eg Operating, Intensive Therapy, Radiodiagnostic or Catering departments, etc.

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4 Activity data

4.1 The expression 'Activity Data' refers to an information system developed to help project and design teams by defining the users' needs more precisely. This information constitutes the Activity Data Base, issued to Health Authorities in 1976, and comprises two types of information sheet: Activity Space Data Sheets (known as 'A' sheets) and their supporting Activity Unit Sheets (known as 'B' sheets).

4.2 'A' sheets record in more detail than is given in this Note each task or activity that is performed in a particular activity space (which may be a room, space or bay) together with details of the environmental conditions and the technical data necessary to enable the activities to be performed. Each 'A' sheet also contains a list of the titles and code numbers of the relevant 'B' sheets which give, both in narrative text and in graphics to scale, equipment fitted or supplied as part of the building and engineering terminals which satisfy the required user activities.

4.3 Further information about the use and preparation of Activity Data can be found in the *Guide to 'A' and 'B' Activity Data Sheets and their use in Health Building Schemes* issued to NHS Authorities in June 1980.

Activity data applicable to this Note

4.4 The 'A' and 'B' sheets recommended for the activity spaces described in this Note have been newly prepared or selected from existing sheets. Their code numbers and titles are provided on the lists which follow.

4.5 Further Activity Data sheets may be selected, or drawn up by project teams to their own requirements, for any services not described in the Note or included in the list. However, in order to ensure consistent and economic provision, variations from the 'A' sheets recommended for the spaces covered in this Note should be considered only where it has been decided that the function of a space will differ from that described.

List of activity data 'A' sheets

Activity space		'A' sheet code no		para number in building note
Reception		J0209		2.19
Administration office	C	M0101	M0111	2.21
Waiting areas		J1118	J1119	2.22
Consulting/examination suite		C0202		2.26
Orthoptists' room		C1001	C1005	2.33
Ophthalmic opticians' room		C0206		2.37
Dark room		C1002		2.38
Treatment room		X0205		2.40
Fluorescein angiography room		C1003		2.43

List of activity data 'A' sheets (*cont.*)

Activity space		'A' sheet code no		para number in building note
Waiting/recovery area		X0504		2.46
Dispensing optician's room*		C1004		2.47
Staff base		T0107		2.48
Clean utility		T0501		2.49
Dirty utility		Y0401		2.50
Patient WCs	C	V1202	V1204	2.51
Staff changing*		V0606	V0607	2.52
Staff WC	C	V1018		2.52
Cleaners' room	C	Y1501		2.53
Store		W1301		2.54
Switchroom		K0101		2.55

* Essential complementary accommodation (See Chapter 5)
C Common activity spaces

List of activity data 'B' sheets

'B' Sheet Code No		Activity Unit Title
A02AH	C	Cleansing, clinical handwashing
A05BH		Preparation/storage, Controlled Drugs and medicines, 3 cupboards, fridge
A05CF		Preparation/storage, Worktop, 1800 × 600 mm with sink unit and shelves over
A19AI	C	Staff base, Nursing section
A22AJ		Examination, Eyes, patient on couch or seated
A22AK		Examination, Assessment of refraction test type at 3 m
A22AM		Examination, Assessment of refraction test type at 6 m
A22BB		Examination, Couch and steps only (no changing facility)
A23AF		Examination/treatment, Synoptophore
A23AH		Examination/treatment, Perimeter
A23AI		Examination/treatment, Bjerrum screen
A23AL		Examination/treatment, Slit lamp
A23AS		Examination/treatment, Ophthalmology
A23AT		Examination/treatment, Lees screen
A23AU		Examination/treatment, Fundus camera
A23AW		Examination/treatment, Orthoptists' desk unit
A23AX		Examination/treatment, Orthoptists' work station
A27AB	C	Assessment, Viewer X-ray film, double wall-mounted
A29AL	C	Holding/testing, Urine testing
A31CM		Radiography bench, with X-ray illuminator inset

List of activity data 'B' sheets (*cont.*)

'B' Sheet Code No		Activity Unit Title
B02BM		Cleansing, Sink unit with 2 shelf tier, 900 × 300 mm
B04BO		Storage, Cupboard, 900 × 1200 × 300 mm wall-mounted, 5 adjustable shelves
B04FN		Storage, Cupboard, 500 × 600 × 300 mm wall-mounted, 1 shelf
B04HA	C	Storage, Clean and sterile supplies, 9 basket rack, 3 trolleys, 3 shelves over
B04IB	C	Storage, Bin mobile, plastic
B04KN		Storage, Cupboard, 1800 × 600 × 500 mm, 1 shelf, 3 units lockable
B04KP		Storage, Cupboard, 600 × 600 × 300 mm wall-mounted, lockable, melamine faced
B04NI		Storage, Cupboard, 600 × 600 × 300 mm wall-mounted, adjustable shelves
B04NL		Storage, Cupboard, stationery 1800 × 900 × 450 mm, shutter front, lockable
B05CF		Preparation/storage, Cupboard, 800 × 1200 × 500 mm, lockable with worktop
B08AO	C	Disposal holding, Dirty utility
B11BA		Reception, Counter with flap
B14AQ		Administration, Desk, single pedestal with chair and SO
B14AY		Administration, Desk, single pedestal, chair, telephone and SO
B14AZ		Administration, Table with chair and socket outlet
B15AH		Secretarial, Typist's desk unit with telephone
B27AU	C	Toilet, WC Staff male
B27BD	C	Toilet, Personal washing and shaving, staff, non residential
B27EB	C	Toilet, Handrinse basin, work area
B27EW	C	Toilet, WC wheelchair and personal washing
B43AA	C	Grooming, Mirror, 600 × 300 mm wall-mounted, shelf under
B52AA		Cleansing, Domestic sink unit
C01CD		Clothes storage, Locker clothes, echelon twin, LH Format
C01GD		Clothes storage, Locker, small wall-mounted
C03CB & CC		Storage, Hooks, hat and coat
C03CH		Storage, Hooks, hat and coat, eight
C03GI	C	Storage, Clip, spring 32 mm diameter
C04CA to CD		Chairs, Upright
C04CE to CH		Chairs, Upright and easy
C04CI		Chairs, Easy, unit
C04DB		Chairs, Child, upright, stacking, seat height 280 mm
C04GA		Chairs, Adjustable, 450–500 mm mobile
C09FA to FC		Tables, Occasional
C09GA		Tables, Child, 470 × 1200 × 700 mm
C10CC		Worktop, 1200 mm
C10DK		Worktop, 2000 mm
C12CA		Disposal containers, Holder, sack, small, free-standing
C13CA		Bookcase, Standing 900 × 1200 × 300 mm open 2 shelves
C13CE		Bookcase, Solid front, floor standing, lockable
C17CA		Mirror, Wall-mounted, 1500 × 400 mm
C18CA & CB		Display panels
C19DA & DB		Chalk boards
C23CA & CB		Cabinets, Filing
C31KF		Trolleys, Cleaners
C33FB		Shelving, Square ends, 1500 × 300 mm
C33GA		Shelving, Square ends, 1800 × 300 mm
C33HC		Shelving, Square ends, 2100 × 400 mm
C52DD		Domestic cleaning, Scrubbing/ polishing machine, household type
C52EA		Domestic cleaning, Trolley bucket, wringer
C52EC	C	Domestic cleaning, Dry suction machine, industrial cylinder

5 Cost information

5.1 For all types of health buildings it is clearly of vital importance that building cost and revenue expenditure should be kept as low as possible consistent with acceptable standards. Within this general context building notes provide a synopsis of accommodation for health buildings which the Department, in conjunction with the National Health Service, recommends for the provision of a given service.

Sharing spaces and the multiple use of space

5.2 In planning the operational policies for a project the aim should be to achieve the optimum use of space by as much sharing with the adjoining out patient department as is possible without detriment to the needs of patients and staff and to the proper functioning of the spaces involved. Sharing may require some enlargement of a space and the provision of additional equipment. The principles by which maximum use of activity spaces can be achieved as given in paragraph 2.4 can be applied in this Note to:

a. Cleaners' room

b. Switchroom.

Essential complementary accommodation (ECA)

5.3 This comprises activity spaces which are essential to the running of the ophthalmic clinic but which in certain circumstances may be available in a convenient location elsewhere, either in a new development or an existing building. The amount of ECA which will need to be provided as part of an individual project will therefore vary according to the extent of the provision available elsewhere. The ECA comprises the staff locker room.

Options

5.4 This Note, where appropriate, draws attention to alternative ways of providing services or facilities, including the likely cost implications. This information will enable project teams to select the solution which is most suitable to their needs. The option covered in this Note is the provision of a room for a dispensing optician if this service is considered to be required (2.4) or to be used for contact lens fitting (2.37).

Cost allowance

5.5 To prepare the cost allowance for a scheme, reference should be made to the current edition of Appendix 7 to Hospital Building Procedure Note 6—Capricode. The total departmental cost allowance appropriate for any scheme is derived by aggregating the cost of the functional units in the particular scheme, adjusted as necessary where sharing is appropriate.

5.6 The cost allowance covers the building and the engineering guidance set out in this Note. The costing of the functional units assumes that they will be incorporated into a whole hospital to form a complete department.

5.7 The functional units in this Note are:

a. Ophthalmic clinic—3 consultants
4 consultants
5 consultants
6 consultants

b. Dispensing optician

Schedules of activity spaces for each functional unit are provided at the end of this chapter.

Dimensions and areas

5.8 In determining spatial requirements, the essential factor is not the total area provided by the critical dimensions, ie those dimensions critical to the efficient functioning of the activities which are to be carried out. There are therefore no recommended areas associated with the schedules of activity spaces. To assist project teams in preparing detailed design solutions for the rooms and spaces, the Department has carried out studies to establish dimensional requirements in the form of critical dimensions. The results of these studies appear as ergonomic diagrams in Appendix II of this Note and in the draft Health Building Note *Common Activity Spaces*, which has been made available to Regional Health Authorities as a working document.

5.9 It is recognised that for development planning and at the earliest stage of a departmental design, it may be convenient for designers to have data available which enables them to make an approximate assessment of the sizes involved. For this reason the schedules of areas, prepared for the purpose of establishing the cost allowance, are included with the health notice promulgating the Departmental Cost Allowance for this Note. It is emphasised that the areas published DO NOT represent recommended room sizes nor specific individual entitlements.

Ophthalmic clinic

5.10 The Departmental cost allowances have been prepared for clinics comprising 3 to 6 consulting rooms, provision for 3 or 4 orthoptists and an ophthalmic optician, together with a treatment room, dark room and a room for fluorescein angiography. Ancillary accommodation comprising reception, administration, waiting, utilities and toilets are also included.

Dispensing optician

5.11 A separate allowance to provide a room for a dispensing optician is included (2.47). It is assumed that if needed this will be provided within the ophthalmic clinic and that no increase in ancillary areas will be required.

Staff changing

5.12 The Departmental cost allowance assumes that staff will use changing facilities either provided centrally or in the main out patient department. ECA provides a cost for staff locker accommodation which may be included in the clinic if it is a local policy.

Engineering

5.13 The costs allow for the provision of the necessary space for a heating and ventilation zone adjacent to external walls and for small vertical ducts. This space is included in the schedules of areas for costing purposes as part of the circulation provision.

Communications—plant space

5.14 Plant rooms with the exception of an electrical switchroom, are not included in the costs.

Engineering services

5.15 The following engineering services as described in the Engineering Chapter and exemplified in Activity Data are included in the Departmental cost allowances. All engineering main services are assumed to be conveniently available at the boundary of the department.

a. *Mechanical services*

Drinking water, cold water services and hose-reel piping to take off points (storage tanks and hose-reels excluded).

Aspect zone LTHW radiator heating system with touch temperature not exceeding 82°C.

The domestic hot water supply at 60°C (storage excluded).

Clean and dirty extract systems.

Tempered air supply to make up extract from blacked-out rooms.

Zoned automatic controls for heating system and remote sensor thermostatic radiator valves where appropriate.

Thermal insulation for services to latest DHSS requirements.

b. *Electrical services*

Departmental distribution switchboard.

General lighting with dimming and selective switching as required by tasks.

Fluorescent, tungsten and emergency lighting fittings as appropriate.

Socket-outlets and other power-outlets for fixed and portable equipment.

Standby and safety installation from the main hospital supplies.

Next-patient and staff emergency call systems.

Telephone conduits only.

Synchronous clocks.

Fire and drugs cupboards alarm systems.

Battery for operating lamps.

c. *Equipment* (group 1)

Operating and examination luminaires.

Schedules of activity spaces

Activity space	Number of consultants			
	3	4	5	6
Basic accommodation				
1. Reception	1	1	1	1
2. Administration office	1	1	1	1
3. Waiting areas—adults	1	1	1	1
4. Waiting areas—children	1	1	1	1
5. Consulting/examination suite	3	4	5	6
6. Orthoptists' room	1 (3)	1 (3)	1 (3)	1 (4)
7. Ophthalmic opticians' room	1	1	1	1
8. Dark room	1	1	2	2
9. Treatment room	1	1	1	1
10. Fluorescein angiography room	1	1	1	1
11. Waiting/recovery area	1	1	1	1
12. Staff base	1	1	1	1
13. Clean utility	1	1	1	1
14. Dirty utility	1	1	1	1
15. Patient's WC—ambulant	1	1	2	2
16. Patient's WC—wheelchair	1	1	1	1
17. Staff WC	1	1	1	1
18. Cleaners' room	½	½	½	1
19. Store	1	1	1	1
20. Switchroom	½	½	½	½
(i) Nos. ( ) Orthoptists				
(ii) Where activity spaces are shown thus (½) this indicates accommodation which is shared with the main out patient department.				
ESSENTIAL COMPLEMENTARY ACCOMMODATION				
1. Staff locker accommodation	1			
OPTIONAL ROOM				
1. Dispensing optician	1			

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Appendix I

Glossary of terms

Angiography A method where a chemical dye is injected into the blood stream to show the outline of blood vessels. In ophthalmology the vessels on and behind the fundus (retina) can be examined and photographed.

Bjerrum Screen A wall mounted screen used to provide a record of specialised visual field tests.

Fluorescein A fluorescing chemical dye used in angiography and superficially to outline ulcers on the eye. Also used extensively in contact lens work.

Fundus Refers to the light receptive layer inside the eye at the back of the eyeball (also called retina).

Hess Screen A wall-mounted screen. It is a 'mapping' device used by an orthoptist to show abnormalities of muscle action and effects on eye movement.

Lees Screen A screen mounted in a corner. Also a 'mapping' device.

Ophthalmoscope (Direct) An instrument for viewing the back and inside of the eye, powered by electric batteries or mains.

Ophthalmoscope (Indirect) A specialised instrument to view the back and inside of the eye from a distance of one metre by using a condensing lens.

Orthoptist A specially trained professional in the diagnosis and treatment of eye muscle abnormalities and visual function problems.

Refraction The term used to denote the 'focusing' state of the eyes whether long sighted or short sighted. Also used to describe the method by which the prescription for a pair of corrective lenses is derived.

Slit Lamp A machine incorporating a small binocular telescope with a complex lighting system for examining the eye and sections of the eye in greater detail.

Snellen Test to test refraction The standard used in the UK to estimate the degree of 'distance vision' the patient can achieve.

Synoptophore A complex instrument used by orthoptists to measure degrees of squint and ability of patient to use both eyes together.

Visual Field Analyser (Perimeter) A device to provide a record of the field of vision, ie how much a patient can see in directions other than straight ahead.

Worth 4 Dot A simple test using two green and one red and one white light to show if eyes are used together or suppressing, or giving double vision.

Appendix II

Critical dimensions

Introduction

1. Critical dimensions are those dimensions which are critical to the efficient functioning of an activity; thus the size of components, their position and the space around them may all be critical to the task being performed. Guidance on these dimensions for a particular activity is provided in the form of *component—user data sheets*. These illustrate components, ie equipment, furniture and fittings, and provide ergonomic data on the space required for users to move, operate or otherwise use the component; information about the component, eg fixing heights, and the users, eg reach, is also provided. Component-user data sheets thus complement the information given on Activity Data 'B' sheets (see Chapter 4).

2. This appendix contains sheets relevant to this Note. In addition, ergonomic data common to the design of a number of departments is contained in the *Common Activity Spaces* Health Building Note, to which reference should also be made.

Component dimensions

3. These relate to the size and position of components as follows:

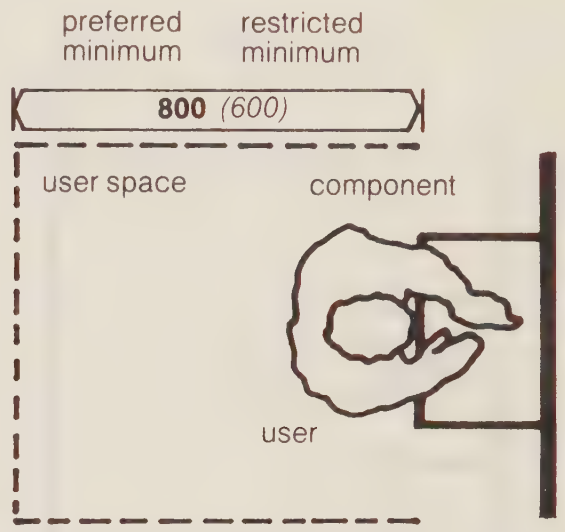
a. Sizes of components are shown thus

b. Preferred component fixing heights are shown as heights above floor level thus

(In some cases an acceptable range of fixing heights is also given in italics.)

Activity dimensions

4. Activity dimensions define the user space, which is the minimum space required to perform an activity. Two types of activity dimension are given:

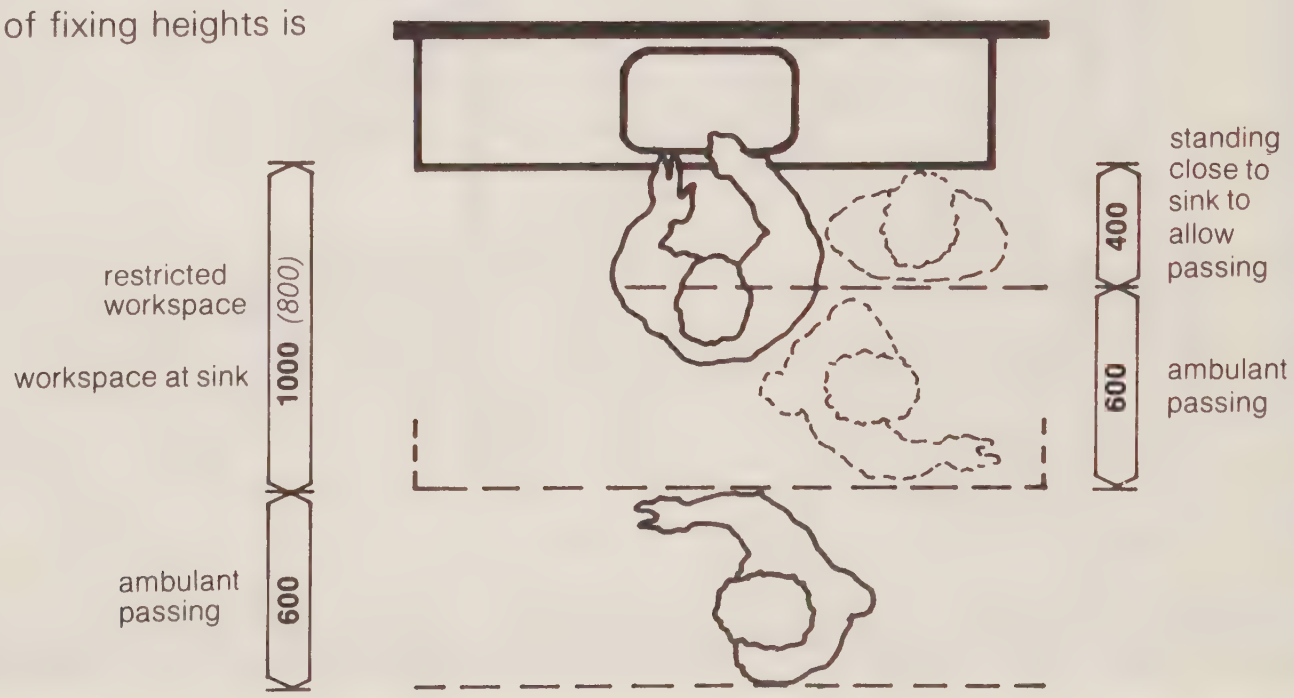


a. Preferred minimum—This defines the minimum space required to carry out an activity efficiently and is shown in bold type.

b. Restricted minimum—This will only allow the activity to be performed at the expense of the user experiencing some difficulty. It is not recommended for general application but may be appropriate when considering the overlapping that can be allowed when two user spaces are adjoining.

Selection of activity dimensions

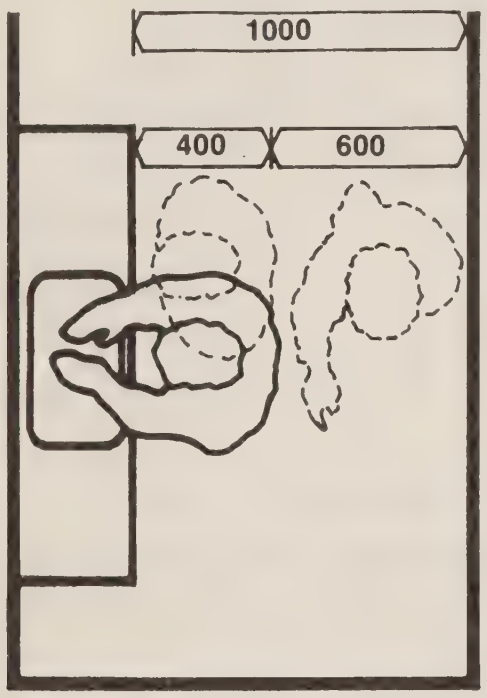
5. When using component-user data sheets to design activity space layouts, selection of the appropriate activity dimensions is essential for economy and efficiency. Selection should be based on careful consideration of the frequency, duration, timing and importance of the activities and also the number of people involved. A typical example of the use of a sink showing activity dimensions provided by the component user data sheet is shown below.



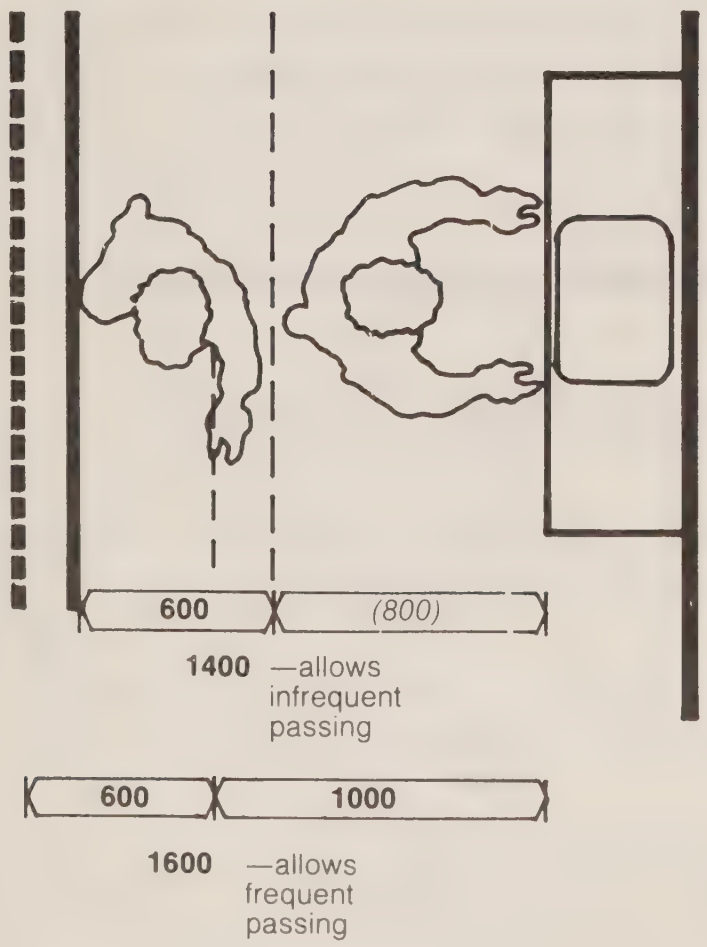
Examples

6. The following worked examples show the sink being used in 3 different situations and show how the appropriate dimensions would be selected. These examples have been simplified and additional factors such as the movement of mobile equipment may also be critical.

a. If the room is normally occupied by one person only the 1000 workspace dimension may be applicable. An (800) restricted dimension should not be used as this dimension is only applicable where two user spaces are adjoining, not where an individual user space is bounded by a wall or solid obstruction. If the person using the sink stops work and stands close to the sink, 1000 is also sufficient space to allow a second person to pass, ie 600 + 400.

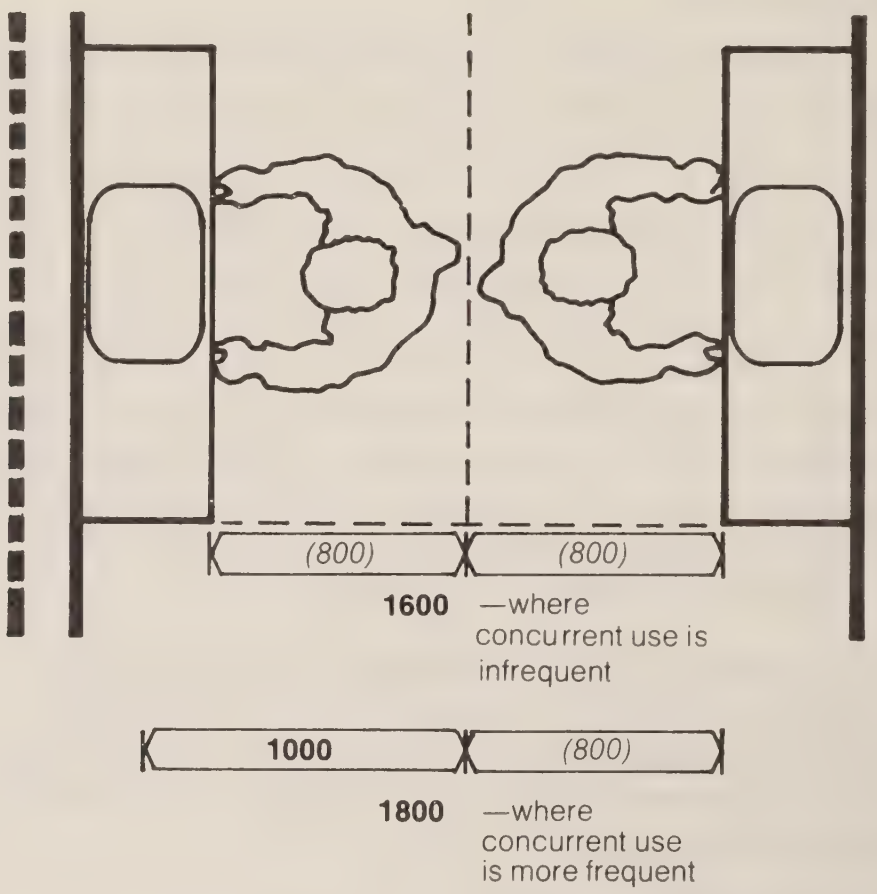


b. If space is required to allow a person to pass, without the user of the sink stopping work, then the 600 passing dimension is added to the workspace dimension. If passing is infrequent then temporary restriction of the sink user's space may be acceptable; this gives an overall dimension of 600 + (800) = 1400. If passing is frequent and restriction of the sink user's space is not acceptable the overall dimension is 600 + 1000 = 1600.



c. Where space has to be provided to enable two sinks to be used concurrently the overall dimension between sinks will be the sum of the workspace dimensions, eg if concurrent use is infrequent and of short duration then (800) + (800) = 1600 may be acceptable. Alternatively 1000 + (800) = 1800 allows the full workspace for one sink user and restricted space for the second user, where concurrent use of the sinks is more frequent.

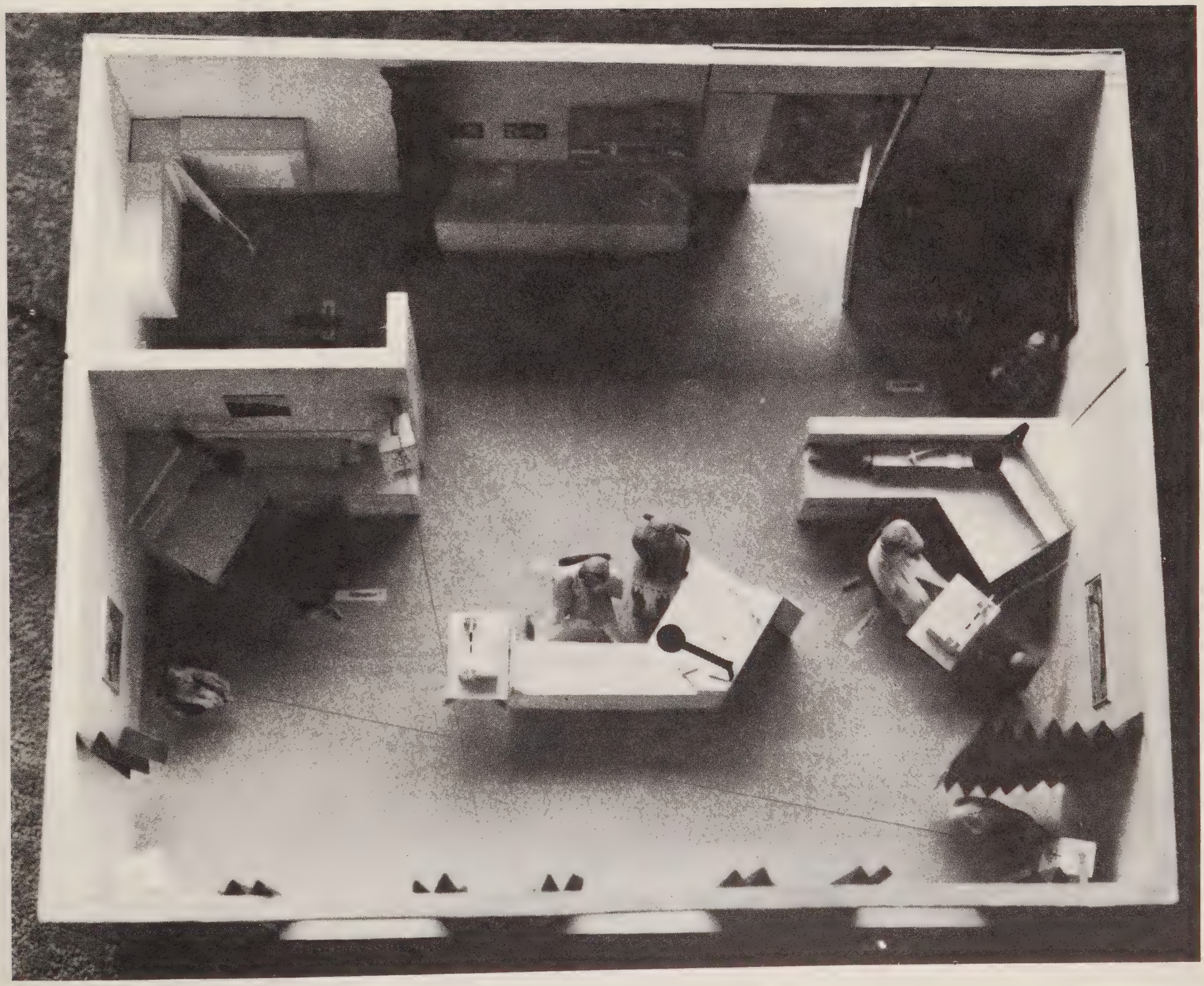
Note. The passing of a third person between the two sink users may also be critical in this example. Where the sinks are staggered 1400 may be acceptable as in example b.



List of ergonomic drawings

1. Model of an orthoptists' room with 3 stations (photograph)
2. Orthoptists' room
3. Orthoptist's workstation
4. Synoptophore
5. Snellen test
6. Lees screen
7. Ophthalmic consultant's workstation (1)
8. Ophthalmic consultant's workstation (2)
9. Slit lamp
10. Treatment chair (ophthalmic)
11. Visual field analyser
12. Perimeter

Model of an orthoptists' room with 3 stations



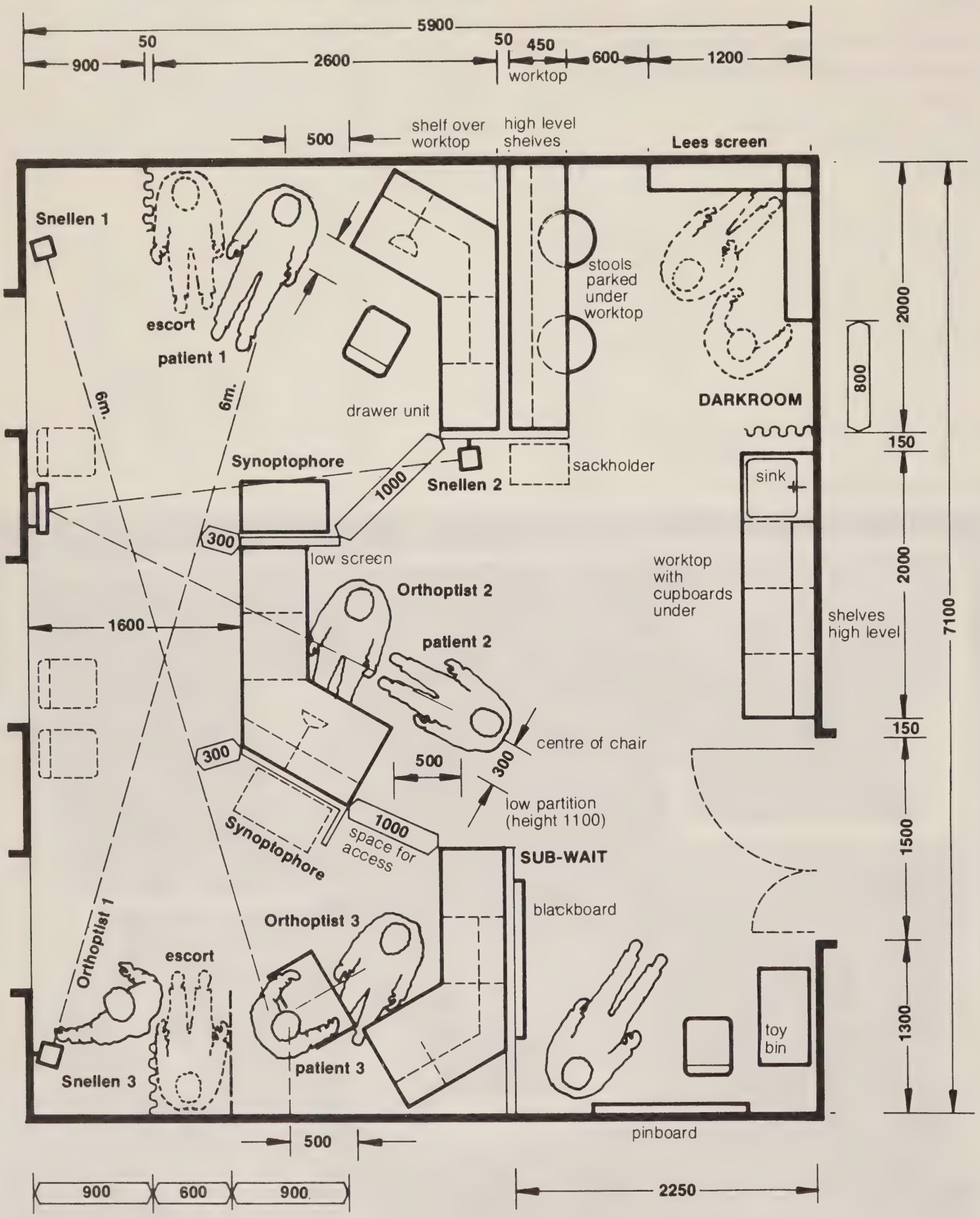
Activities
Activity space with 3no. Orthoptists workstations allowing consultation and most testing to be carried out at the individual workstations.
See also component user data sheets on-

DHSS **Ergonomic data bank**
Activity space example layout, not to scale

Synoptophore, Snellen test, Lees screen, Orthoptist's workstation.

Orthoptist's room

for 3no. orthoptists



1350 *(1300)*

Preferred minimum *Restricted minimum (not recommended for general use: see explanatory notes).*

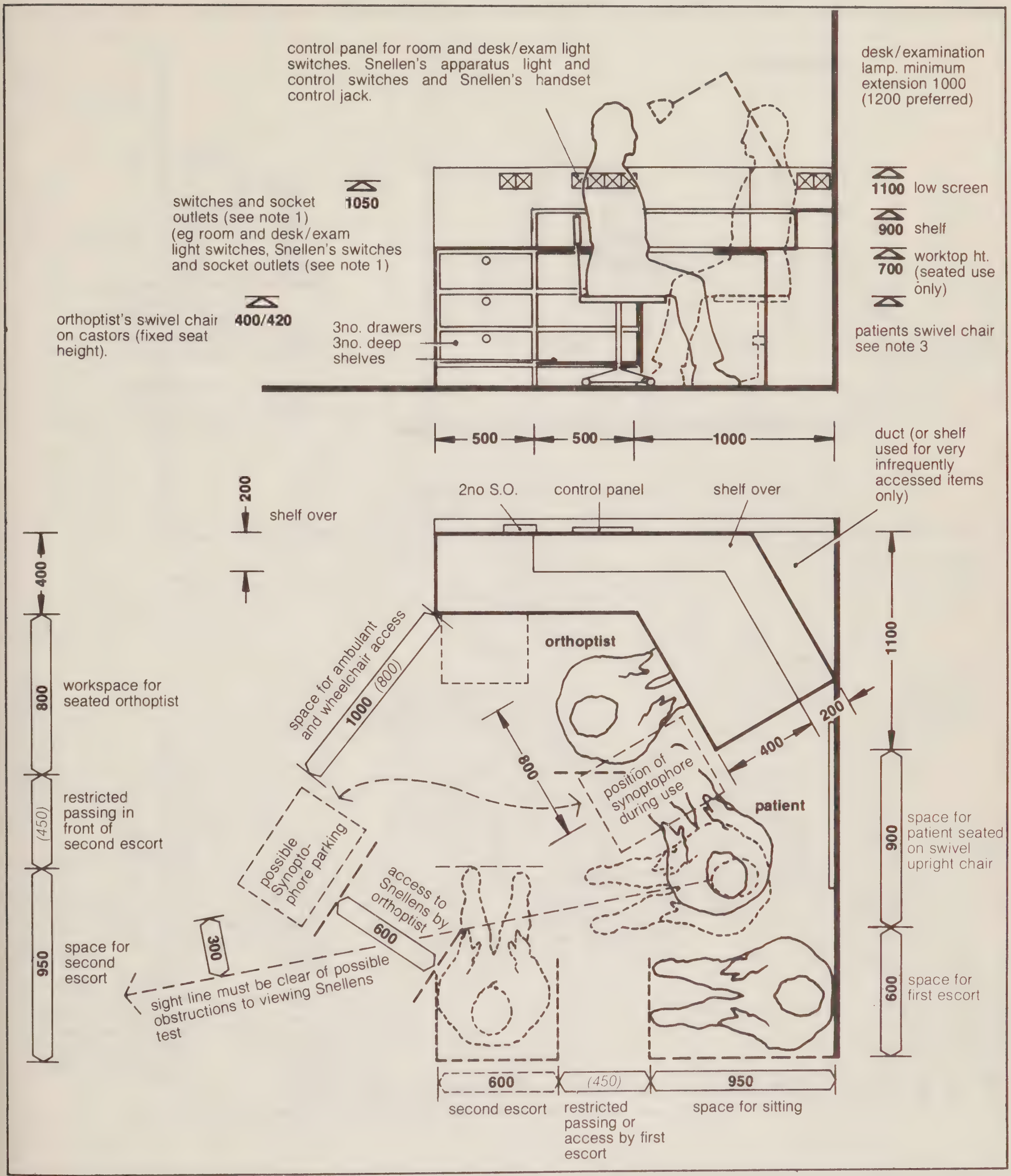
Activities
The workstation is designed to allow consultation and most of the Orthoptic tests, (including Snellens and Synoptophore tests) to be carried out at or from a single examination position.

The shelves and drawers provide storage for equipment and testing apparatus accessible to a seated orthoptist (see also Synotophore & Snellen Test data sheets).

DHSS **Ergonomic data bank**
Component-user data sheet, not to scale.

Orthoptist's workstation

Users
Orthoptist & patient (adult or child) with escorts - occassionally patient in wheelchair.



1350 *(1300)*

Preferred minimum *Restricted minimum (not recommended for general use: see explanatory notes)*

1. Acceptable zones for the location of frequently accessed services on adjacent walls/screens for seated operation:
   a) switches and controls 1000-1250
   b) socket outlets 600-1350

2. It is assumed that space for the second escort will only be used relatively infrequently, and that the need for circulation during the examination will be minimal. Allowances for circulation therefore allow for restricted movement only.

3. Patient's swivel chair - fixed seat height 400/420; adjustable height swivel chair preferred with range of seat adjustment; 400-550 (see also Synoptophore data sheet).

4. Data derived from orthoptists room mock-up 1979.

Activities
Testing patients for squints. Seated patients views slides through binocular viewer. Orthoptist feeds slides into the apparatus. (A typical test involves a patient viewing a slide of a lion and a slide of a cage through the viewer and seeing whether the lion appears to be inside the cage).
Recording results

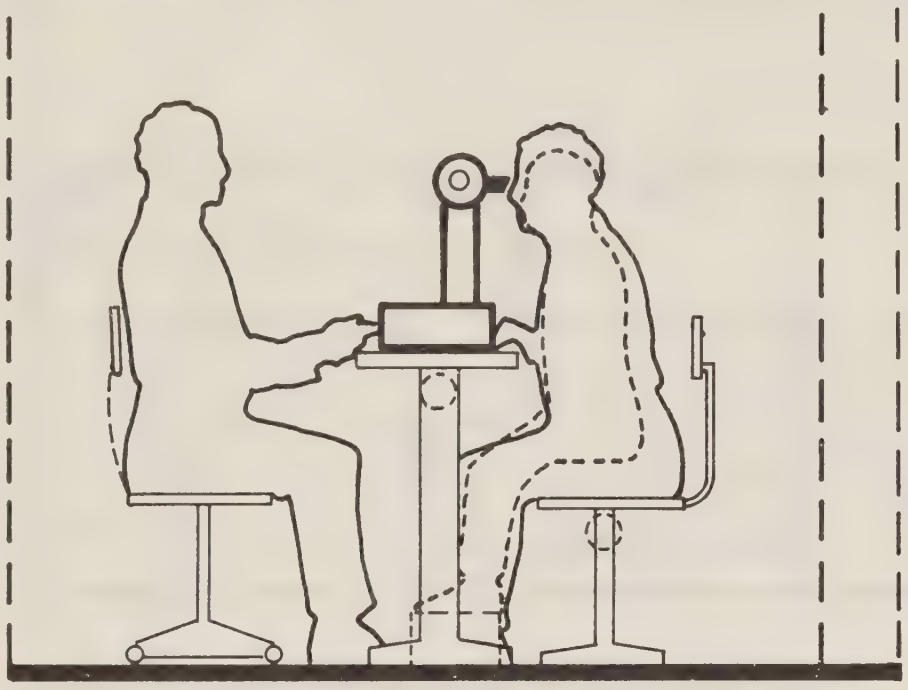
DHSS **Ergonomic data bank**
Component-user data sheet, not to scale

Synoptophore

With mobile adjustable height table

Users
Orthoptist & patients — Children (mainly)
Adult, occasionally wheelchair users

ELEVATION



700
associated worktop (for seated use)

400 height of synoptophore

600-1050 adjustable height table (essential) range of adjustment (see note 3)

400-550 adjustable height chair desirable range (see note 4)

400-420 fixed height chair

200 portable footrest (for children)

900 *(800)* orhtoptist's workspace including space for withdrawal

450 synoptophore table

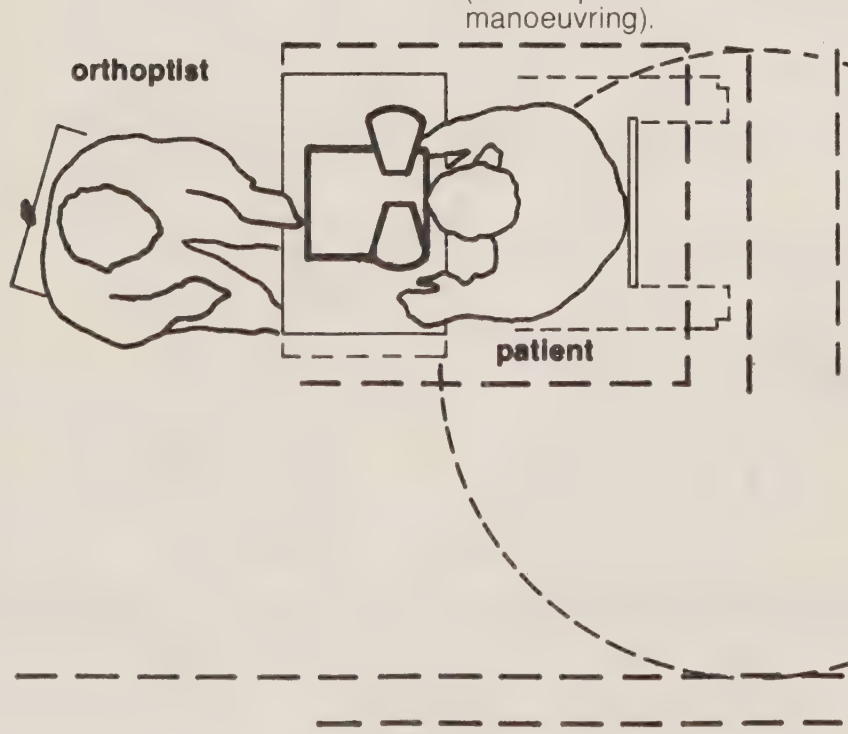
650 *(600)* space for seated patient

250 clearance for access and withdrawal

750 *(700)* space for wheelchair patient

PLAN

1500 *(1400)* wheelchair access & withdrawal (1600 pref. for assisted wheelchair manoeuvring).



1350 *(1300)*

Preferred minimum *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:
1. The Synoptophore test may form part of an Orthoptist's Workstation designed to allow the majority of orthoptic tests and consultation to take place from a single seated examination position.

2. Design of mobile adjustable height table — this should be on the cantilever type with adjustable height mechanism on a pillar support on one side only. The base, together with the castors, should be low enough to pass under the footrest of a standard wheelchair (100 max).

3. A minimum table height of 650 is acceptable for adult use, but is not low enough for small children using a 400 fixed height seat.

4. An adjustable height chair is not essential but it does offer greater flexibility, especially in dealing with children and if used in conjunction with an adjustable height table.

Activities
Estimating errors of refraction with a test card fixed at 6m in front of a seated patient. Recording results.
(With the 3m (indirect) type the patient sees the image reflected in a wall mounted mirror — see note 3).

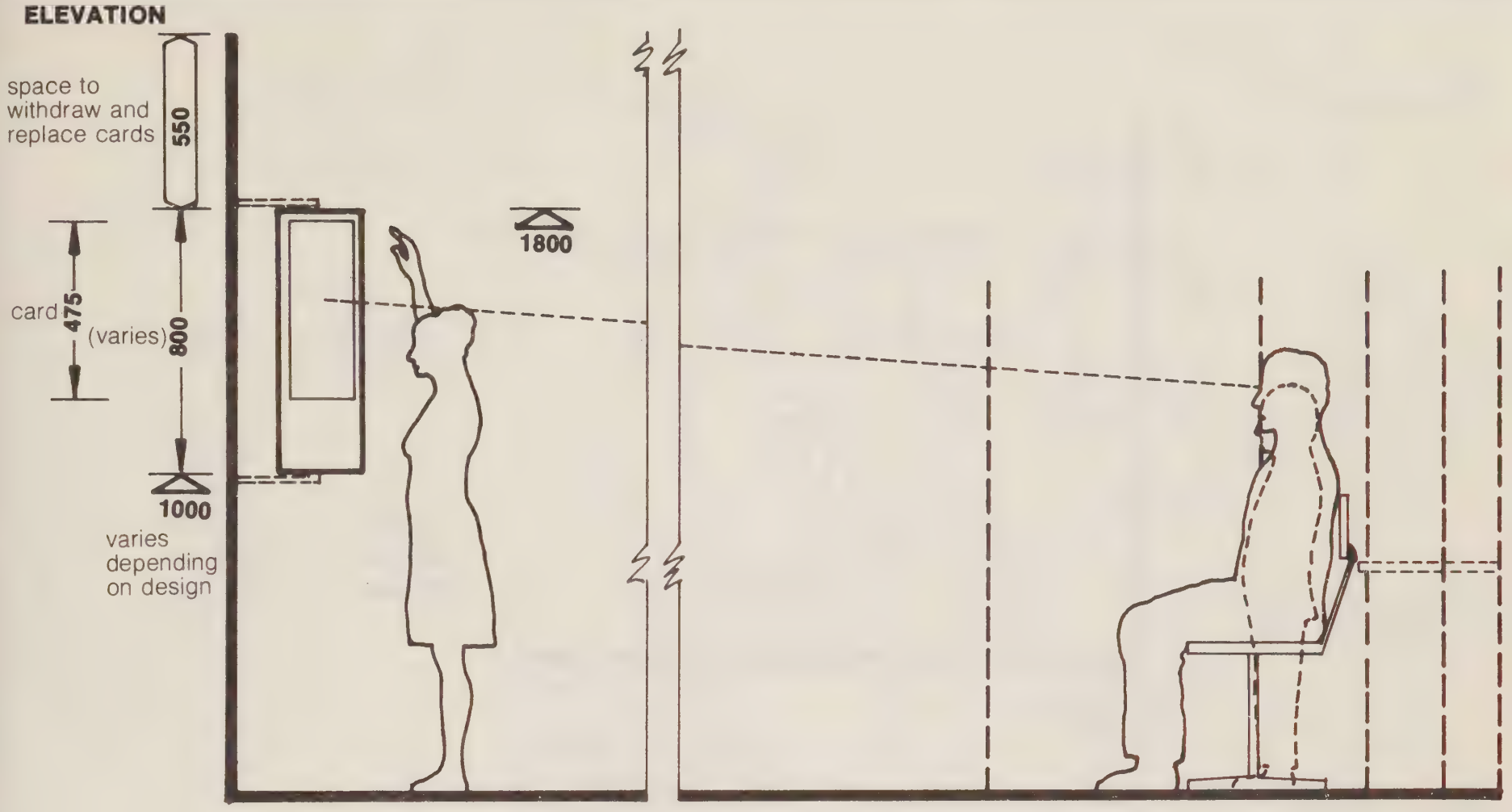
DHSS **Ergonomic data bank**
Component-user data sheet, not to scale

Snellen test

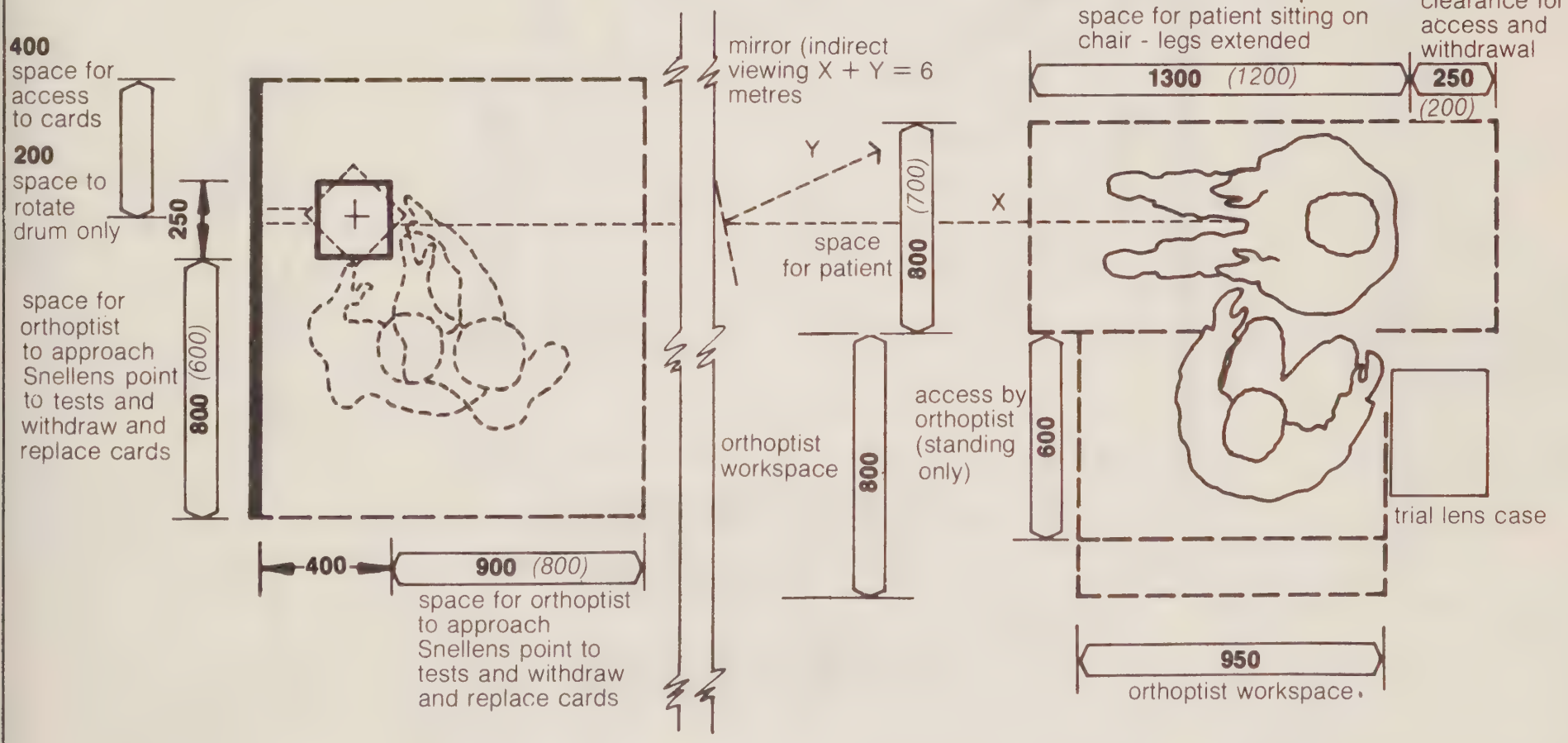
Wall mounted at 6m (direct) or 3m (indirect see note 3)

Users
Orthoptists staff & children and adults, occasionally wheelchair users

ELEVATION



PLAN



1350 *(1300)*

Preferred minimum *Restricted minimum (note recommended for general use: see explanatory notes)*

Notes

1. The Snellens test may form part of an orthoptic workstation designed to allow this and other tests on patients and to take place at or from a single seated examination position.

2. The Snellens drum may be rotated, by hand, or mechanically, or electrically (a floor stand model is also available).

3. Indirect viewing — the patient views the image of the test card in a non distorting wall mounted or stand mounted mirror (550 x 350) the total viewing distance being 6M.

4. Dimension from eye position to slumped back of chair — 350 relates to viewing with a slumped posture (250) relates to an upright posture.

Activities
Testing the visual field. The patient rests his/her chin on the chin-rest and uses one eye to view one of the illuminated screens, and the other eye to view the image on the other screen in a mirror. The orthoptist moves a pointer over one screen and the patient attempts to move the tip of his/her pointer to coincide with this on the screen. The results are plotted. The process is repeated with the orthopist on the opposite side of the patient.

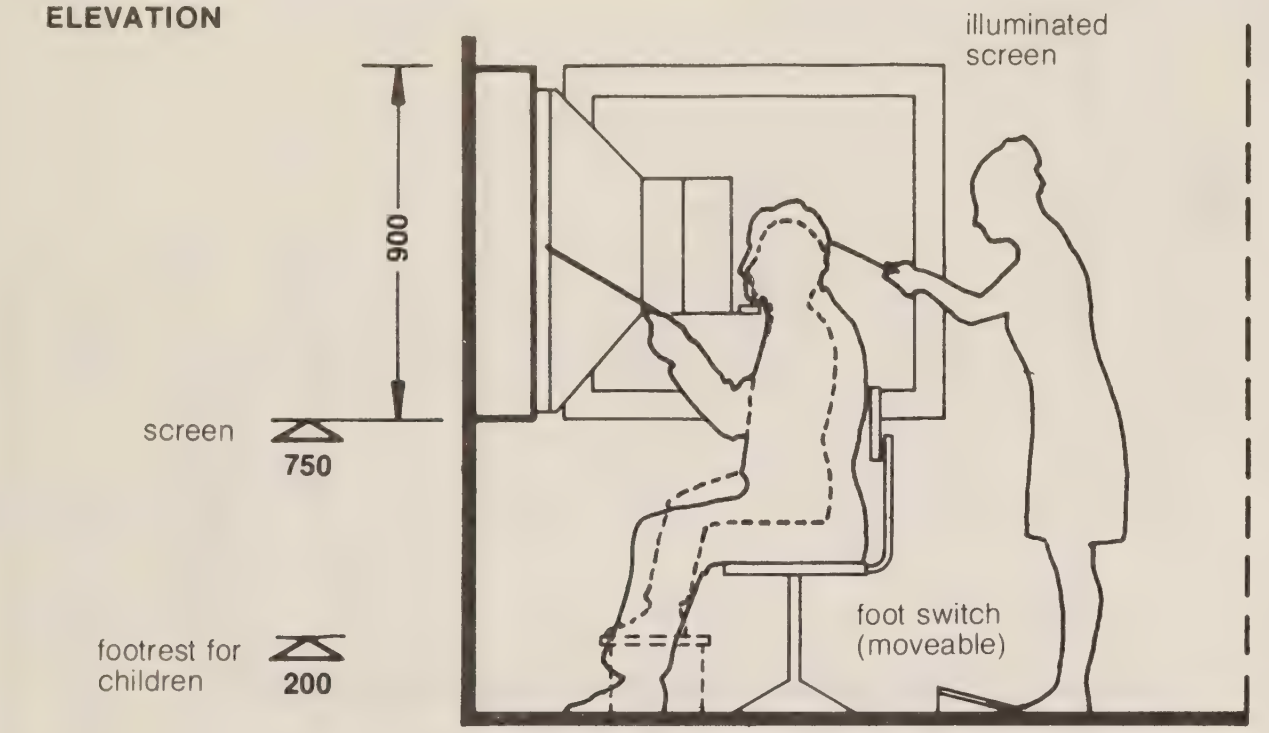
DHSS **Ergonomic data bank**
Component user data sheet, not to scale

Lees screen

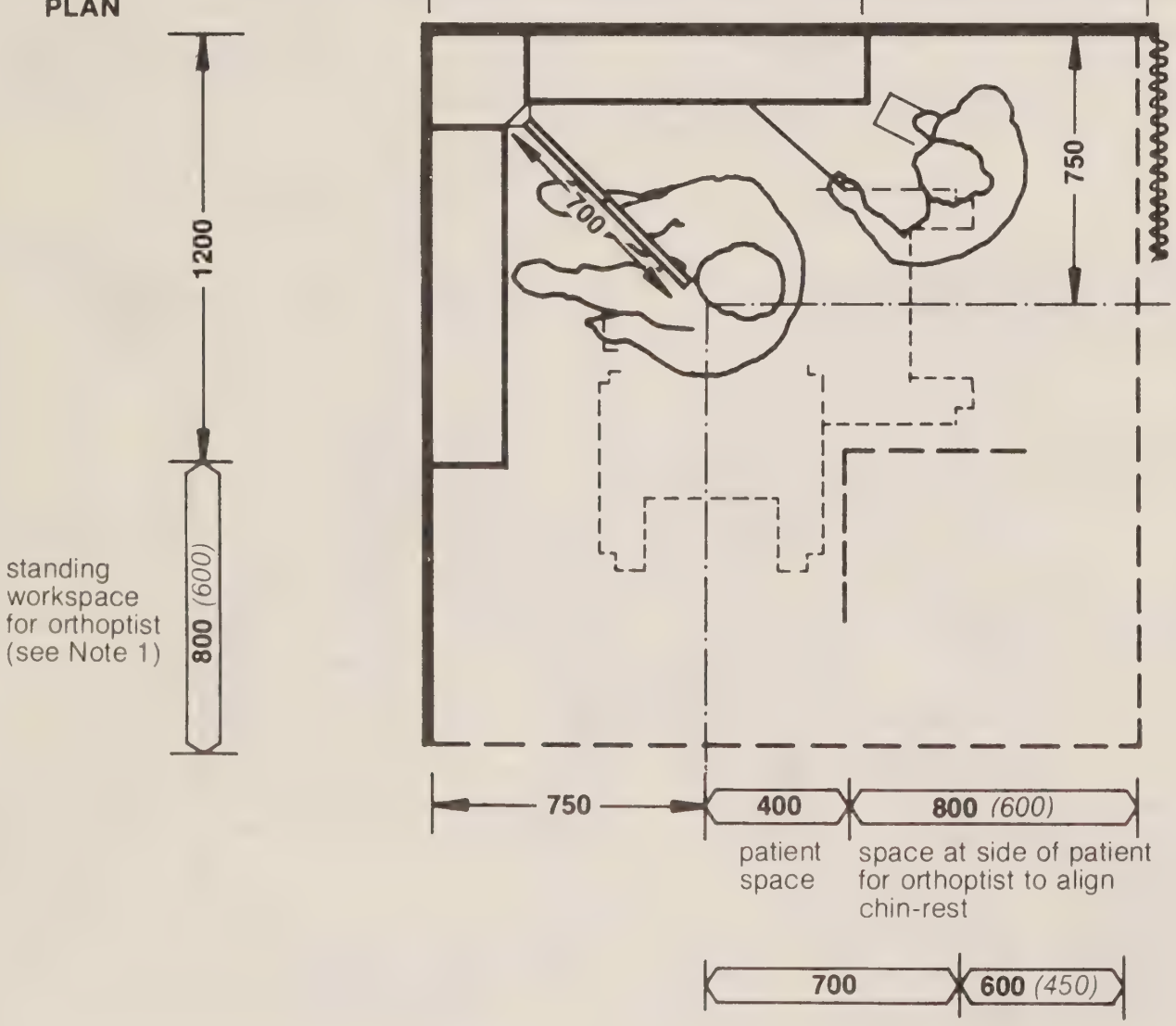
Wall mounted

Users
Orthoptist & patient Adults & children

ELEVATION



PLAN



level of chin-rest if fixed
1050 see Note 2

adjustable height chair
350-600 preferred range
400-500 restricted range

1350 *(1300)*

Preferred minimum *Restricted minimum (not recommended for general use: see explanatory notes)*

1. Restricted workspace shown is inadequate where the patient is in a wheelchair. In this case the restricted dimension should be increased to 700 and the preferred dimension to 900 (i.e. where examination of patients in wheelchairs occurs frequently).

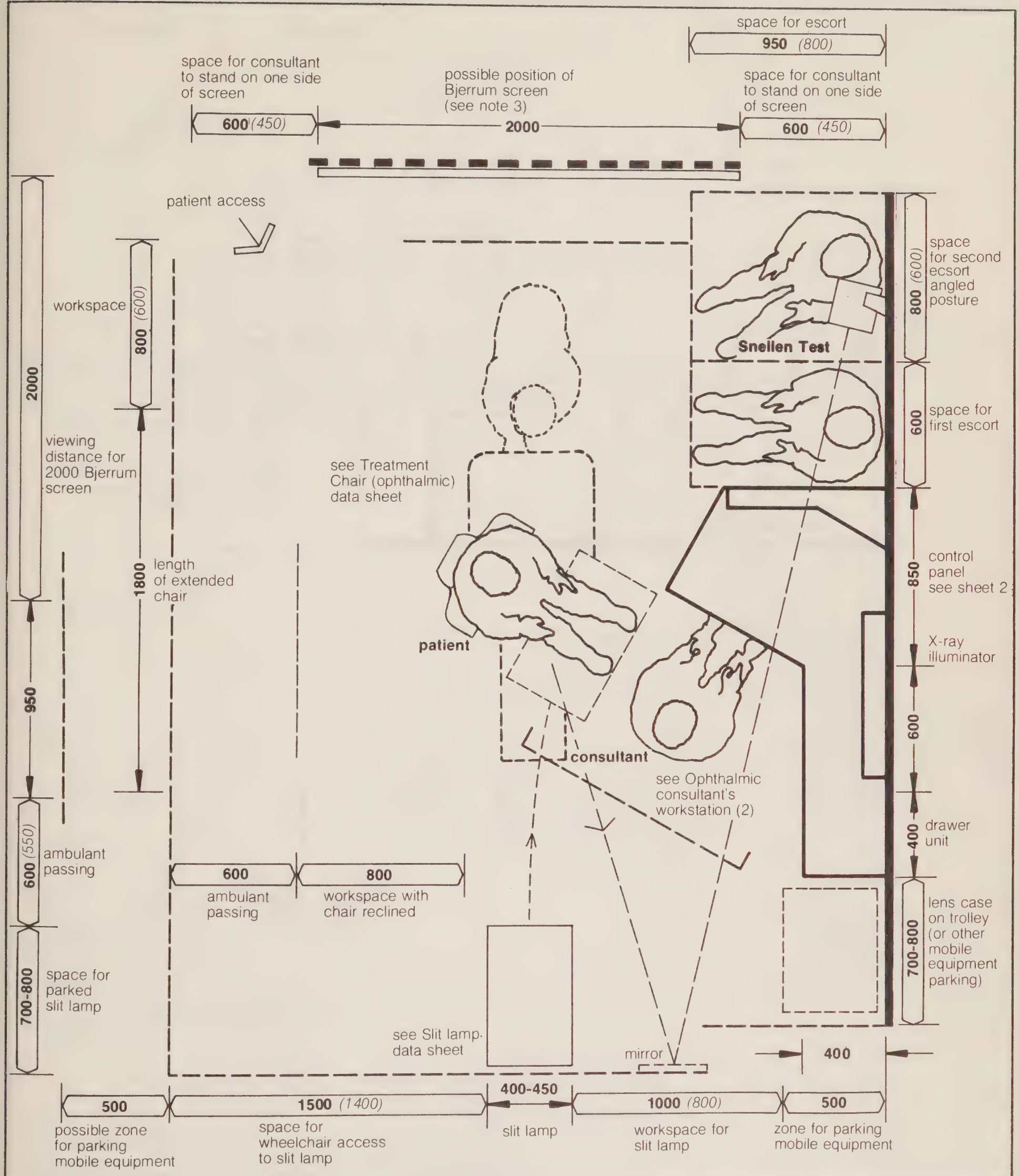
2. This recommendation is based on the need to accommodate wheelchair patients in particular, assuming the possible use of deep cushions by some patients. Where testing of wheelchair patients is infrequent chin-rest height may be reduced to 1000.

Activities
Writing up notes etc., consultation including examination of the eye using Slit lamp, Snellen test, Bjerrum screen and other apparatus, and also minor treatment of the eye.

DHSS **Ergonomic data sheet**
Component-user data sheet, not to scale

Ophthalmic consultant's workstation (1)

Users
Consultant, patients — adult and children



1350(1300)

Preferred minimum *Restricted minimum (not recommended for general use; see explanatory notes).*

1. Drawing to be read in conjunction with Ophthalmic consultant's workstation (2)(3). See also data sheets on Slip lamp and Treatment Chair (ophthalmic).

2. When the patient is a young child it may sit on its mothers knee in the treatment chair. Alternatively the mother may sit by the side of the treatment chair, whilst the child is undergoing examination on the treatment chair.

3. The Bjerrum screen shown is 2000 square and is reviewed at a distance of 2000. (Alternatively a 1000 square screen can be used with a viewing distance of 1000).

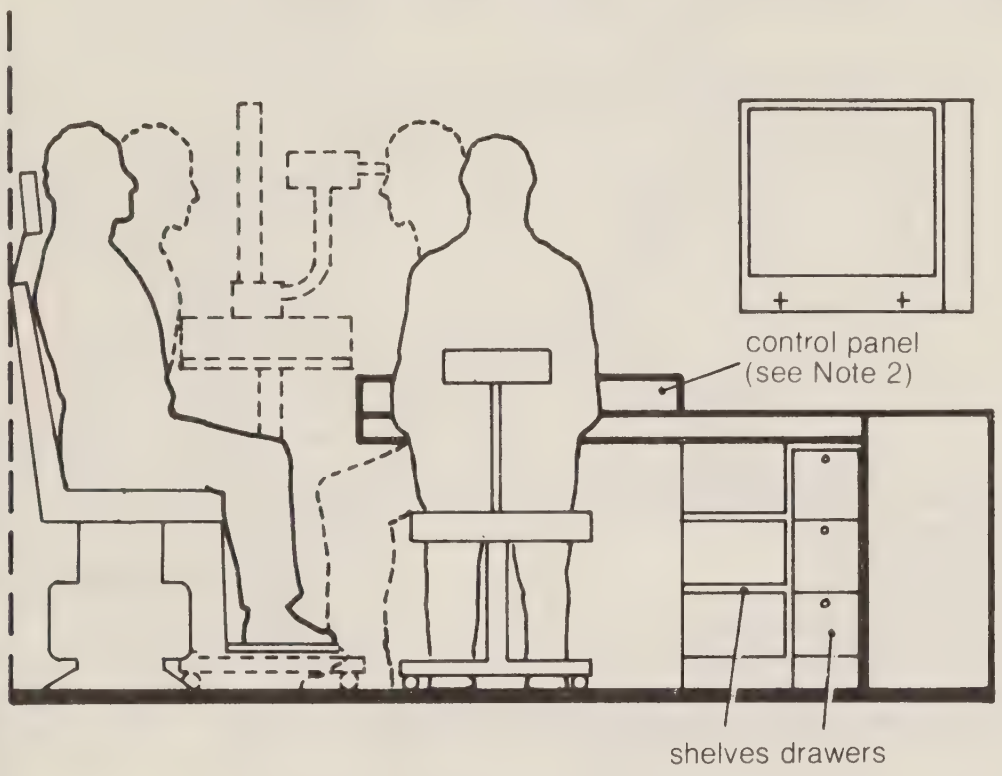
4. Full rotation of prone patient is obstructed by projecting worktop. Full rotation of chair if however possible in upright position. Proximity of patient to consultant is desirable for al examinations other than those requiring a prone posture, consequently some inconvenience in respect of extended chair and passing between chair and desk may be acceptable.

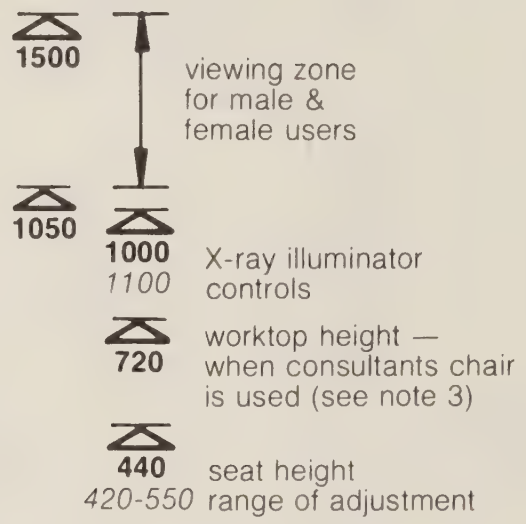
Activities
Writing up notes etc. consultation including examination of the eye using Slit lamp, Snellen test, Bjerrum screen and other apparatus, and also minor treatment of the eye.

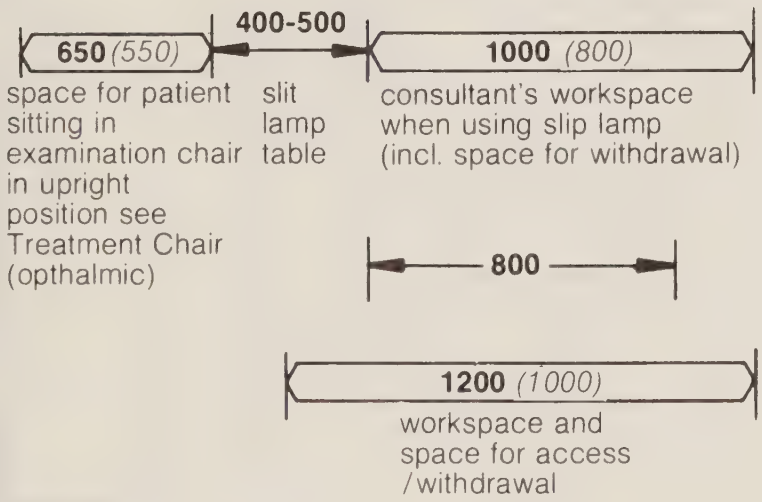
DHSS **Ergonomic data bank**
Component-user data sheet, not to scale

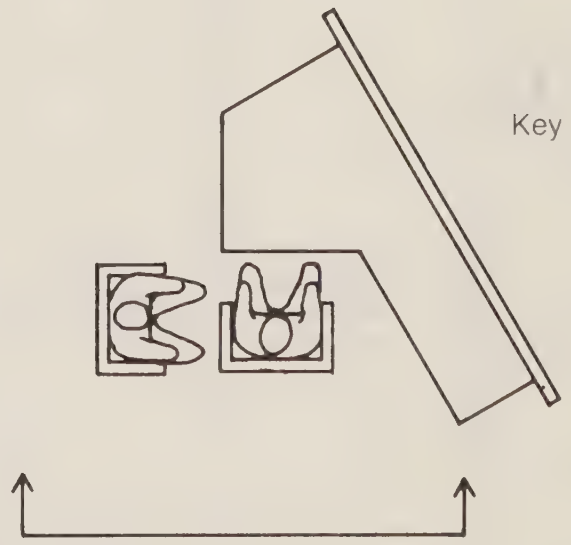
Ophthalmic consultant's workstation (2)

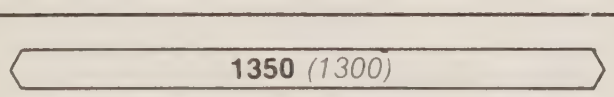
Users
Consultant, patients — adult and children






650 (550)
space for patient sitting in examination chair in upright position see Treatment Chair (opthalmic)
400-500
slit lamp table
1000 (800)
consultant's workspace when using slip lamp (incl. space for withdrawal)
800
1200 (1000)
workspace and space for access /withdrawal





Preferred minimum *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes

1. Drawing to be read in conjunction with Opthalmic consultant's workstation (1). See also data sheets on slit lamp, and Treatment chair (opthalmic).

2. Control panel for room and desk/examination light switches. Snellens apparatus light and control switches and - Snellens handset control jack are best positioned where they can be operated by the consultant when facing the patient.

3. The height of the consultants chair should be adjustable from 420 to 550 for use in conjunction with the worktop shown, the adjustable height treatment chair, the slip lamp table and other equipment. (Alternatively a higher chair or stool with a seat height range of 450-650 can be used in conjunction with a higher worktop at 800-850).

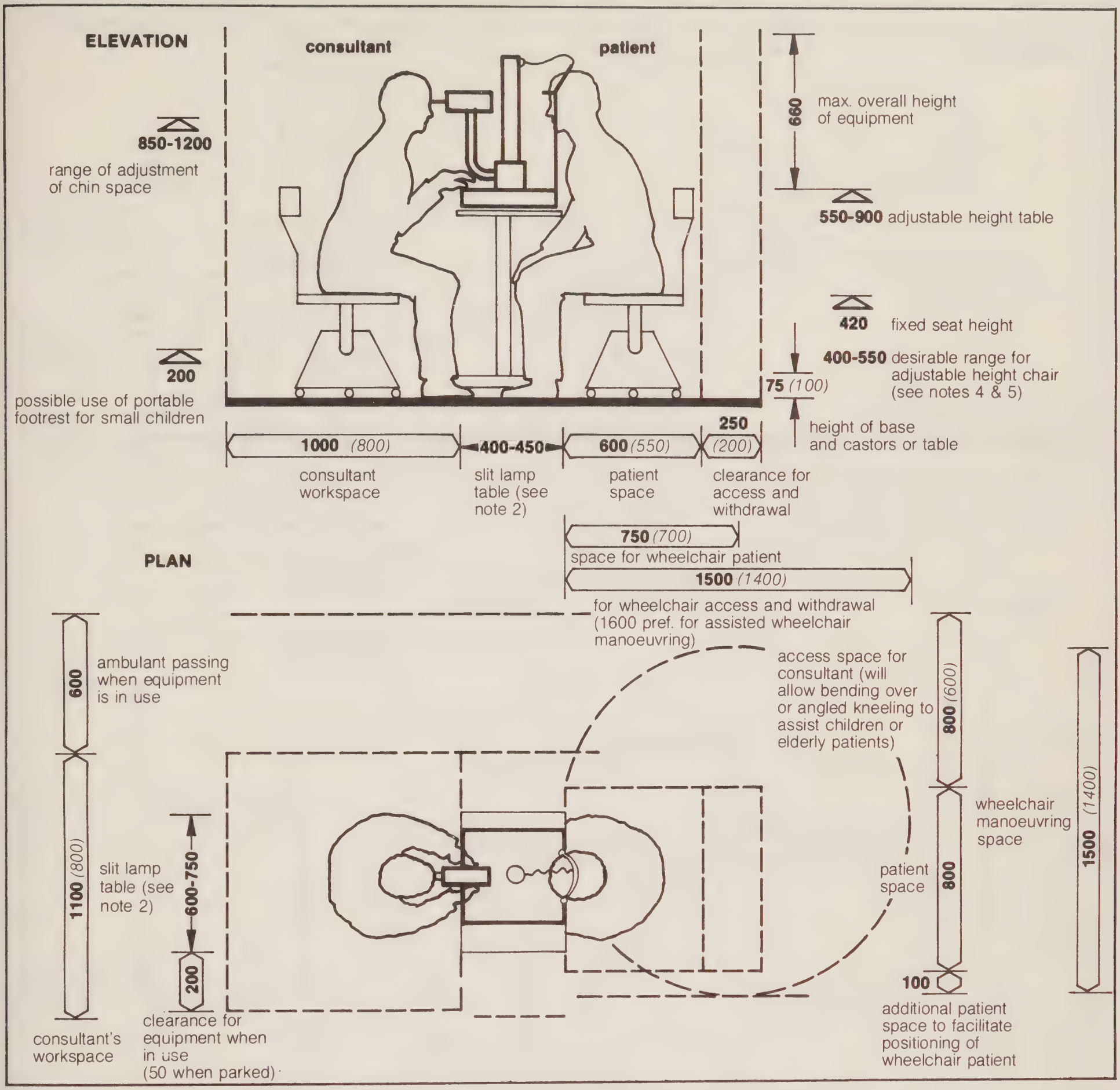
Activities
Examination of patient's eye using binocular viewers and a strip of light, which can be varied in size both horizontally and vertically

DHSS **Ergonomic data bank**
Component-user data sheet, not to scale

Slit lamp

With mobile, adjustable height table

Users
Ophthalmic Consultant, adults, children and occasional wheelchair users



1350 *(1300)*

Preferred minimum *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:

1. The slit lamp is an item of equipment which normally forms part of the Ophthalmic Consultant's workstation. See data sheet on Ophthalmic Consultants Workstation.

2. Design of mobile adjustable height table — this should be very stable. The base, together with the castors should be low enough to pass under the footrest of a standard wheelchair 75 (100). A cantilever type base is preferred.

3. A minimum table height of 650 is acceptable for adult use, but is not low enough for small children using a 420 fixed height seat.

4. An adjustable height chair is essential as it offers greater flexibility, especially in dealing with children and it used in conjunction with an adjustable height table.

5. Wheelchair users, seat height including cushion — 530 (480 without cushion).

6. Lightweight upright chair on castors. Add 50-100 overall (including clearances) for heavier upholstered chairs.

7. The equipment shown cannot conveniently accommodate the whole range of potential users. These recommendations are therefore principally concerned with accommodating adult use, and use by larger children. Use by smaller children will essentially require some improvisation or adaptation.

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Activities
Examination and treatment of patients eyes in reclined position

DHSS **Ergonomic data bank**
Component-user data sheet, not to scale

Treatment chair

Ophthalmic
Chair with adjustable height and angle of recline

Users
Consultant, adults, children (see note 1)

ELEVATION

2050 *(1950)*
clear turning circle for prone patient

armrest
300

arm rest height above seat
165-240
variable seat height (to facilitate wheel-chair transfer - height 550).
clearance under footrest
100

600 ambultant passing
300 *(600)* consultant's workspace access to patient for examination/treatment
600
650 approx. dimension of base
550

1000 *(900)* large man sitting up in chair
250 back & head rest
450
300 foot rest

1800 chair extended

PLAN

access to patient for examination/ treatment
800
600 *(450)* ambulant passing only

min. width of chair arms
min. width of chair seat **450**
min. width of chair arms **50**
width of dressing/ instrument trolley **450**
ambulant passing **600**

dressing/instrument trolley (patient prone)
dressing/treatment trolley (patient upright)

600-500 outside width of chair
800 patient space
clearance of side of prone patient **150** *(100)*
600 length of dressing/ instrument trolley
800 access to patient for examination/ treatment
600 ambulant passing

1200 *(1100)*
clear turning circle for upright patients

Notes

1. It is possible to satisfactorily provide a facility which will provide the range of adjustment necessary for adults and children. The recommendations are therefore primarily concerned with adult usage. However children are generally more adaptable than adults, and whilst the facility is not ideal for child use, it can be used, especially by larger children, without too much inconvenience. For smaller children some improvisation will inevitably be necessary for satisfactory usage (e.g. thje provision of an inset backrest/locational support during upright posture examinations).

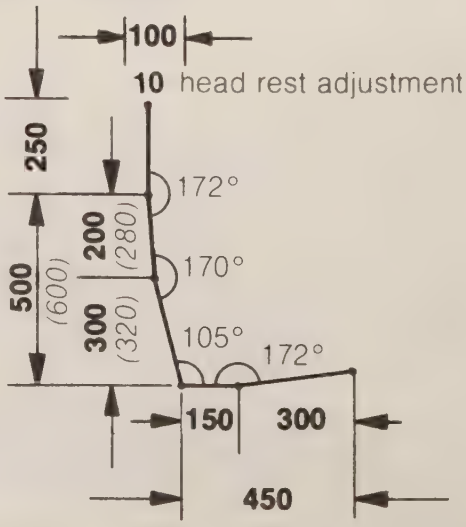
2. The neck and head support must be adjustable in all cases to allow accommodations of all potential users.

3. See also Opthalmic consultant's workstation data sheet.

4. Desirable range of head rest adjustment 500-850 above seat height (min. depth of head rest 150).

5. Minimum zone for lumbar support should be between 200 and 300 above seat height.

6. Recommended angles of seat in upright position.



Activities
Facilities for examination of the patients eyes using a visual field analyser. The patient is seated for the examination and the recording of results is carried out by a member of staff standing (or occasionally sitting) behind or beside the analyser (depending on the model — see note 1)

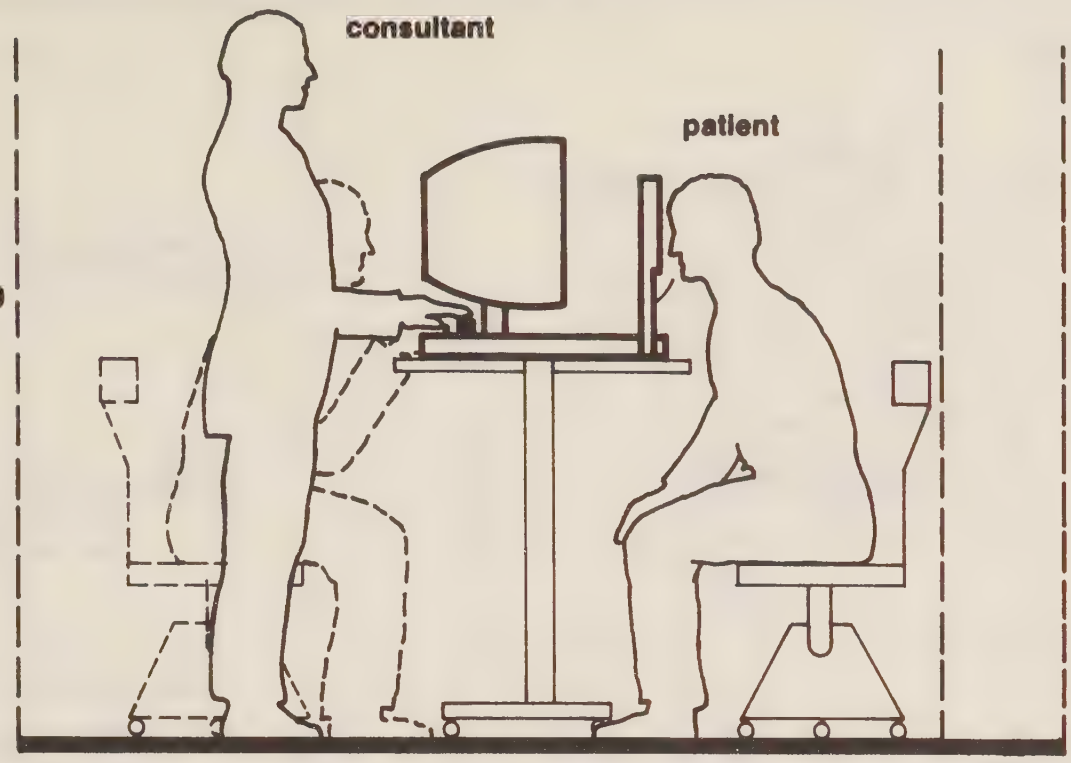
DHSS **Ergonomic data bank**
Component-user data sheet, not to scale

Visual field analyser

2 types — see Note 1

Users
Ophthalmic staff & adults, children occasional wheelchair users.

ELEVATION



1200-850 desirable range of chinrest adjustment

590 max. overall height of equipment

550-950 adjustable height table

420 fixed seat height

400-550 desirable min. range for adjustable height chair (see note 3,4, & 5)

75 (100) height of base & castors of table

200 possible use of portable footrest for small children

900 (800) consultant's standing workspace allows occasional use of upright chair on castors (restricted work-space — will allow use of light chair or stool only) see note 6

700-800 table width

600 (550) patient space (see note 6)

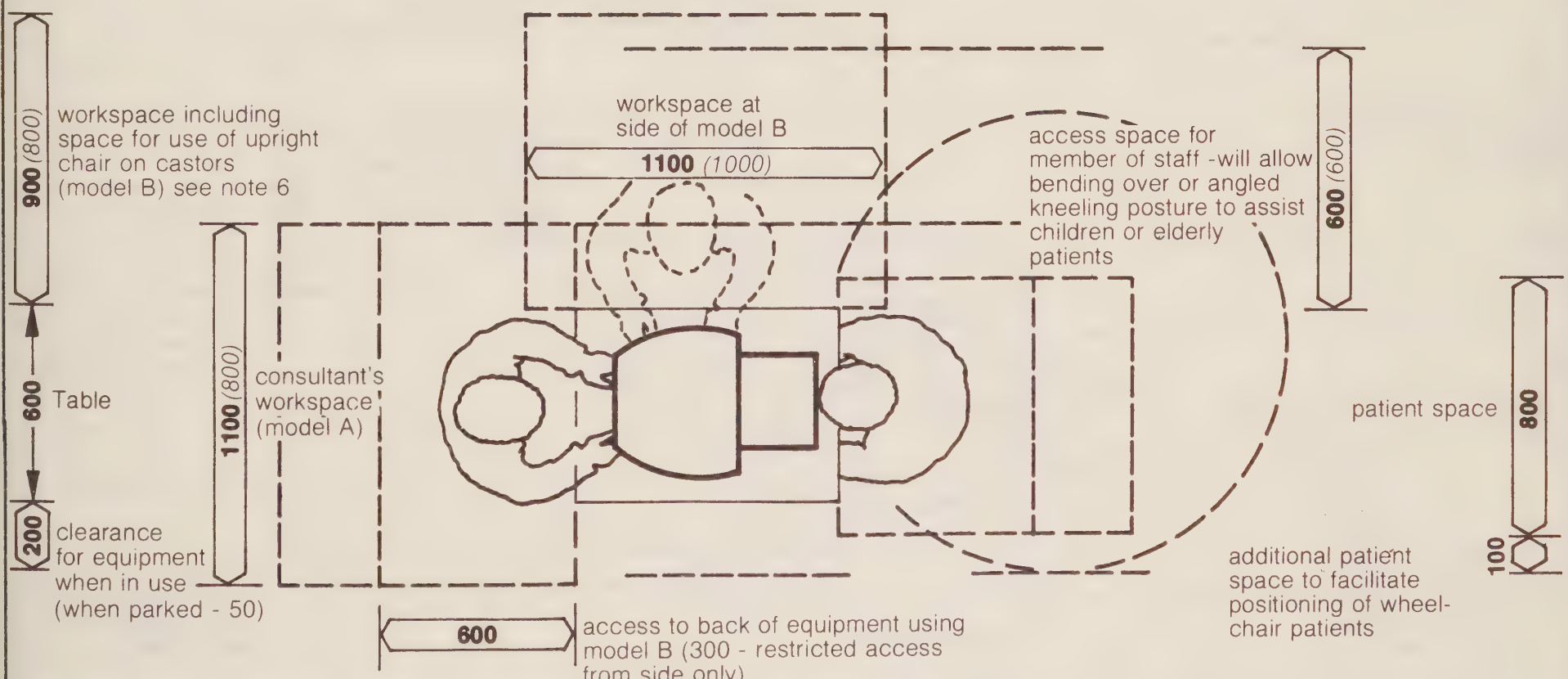
250 (200) clearance for access and withdrawal

650-800 approx. overall depth of equipment (larger type B model - see note 1)

750 (700) wheelchair patient space

1500 (1400) wheelchair access & withdrawal (1600 pref. for assisted wheelchair manoeuvring)

PLAN


900 (800) workspace including space for use of upright chair on castors (model B) see note 6
workspace at side of model B
1100 (1000)
access space for member of staff -will allow bending over or angled kneeling posture to assist children or elderly patients
600 (600)
600 Table
1100 (800) consultant's workspace (model A)
patient space
800
200 clearance for equipment when in use (when parked - 50)
100
additional patient space to facilitate positioning of wheel-chair patients
600 access to back of equipment using model B (300 - restricted access from side only)

1350 (1300)
Preferred minimum *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes:
1. Two types of visual Field Analyser are shown - basic model (A), where filter and other controls are at the rear, and a generally more comprehensive model (B) where the operator controls and records the results to the side of the equipment (see dotted alternative positions for consultant).

2. Design of mobile adjustable height table — this should be very stable. The base together with the castors should be low enough to pass under the footrest of a standard wheelchair 75 (100). A cantilever type base is preferred.

3. A minimum table height of 650 is acceptable for adult use, but is not low enough for small children using a 420 fixed height seat.

4. An adjustable height chair is essential as it offers great flexibility, especially in dealing with children and is used in conjunction with an adjustable height table.

5. Wheelchair users, seat height including cushion - 530 (480 without cushion).

6. Lightweight upright chair on castors. Add 50-100 overall (including clearance) for heavier upholstered chairs.

7. The equipment shown cannot conveniently accommodate the whole range of potential users. These recommendations are therefore principally concerned with accommodating adult use and use by large children. Use by smaller children will essentially require some improvisation or adaptation.

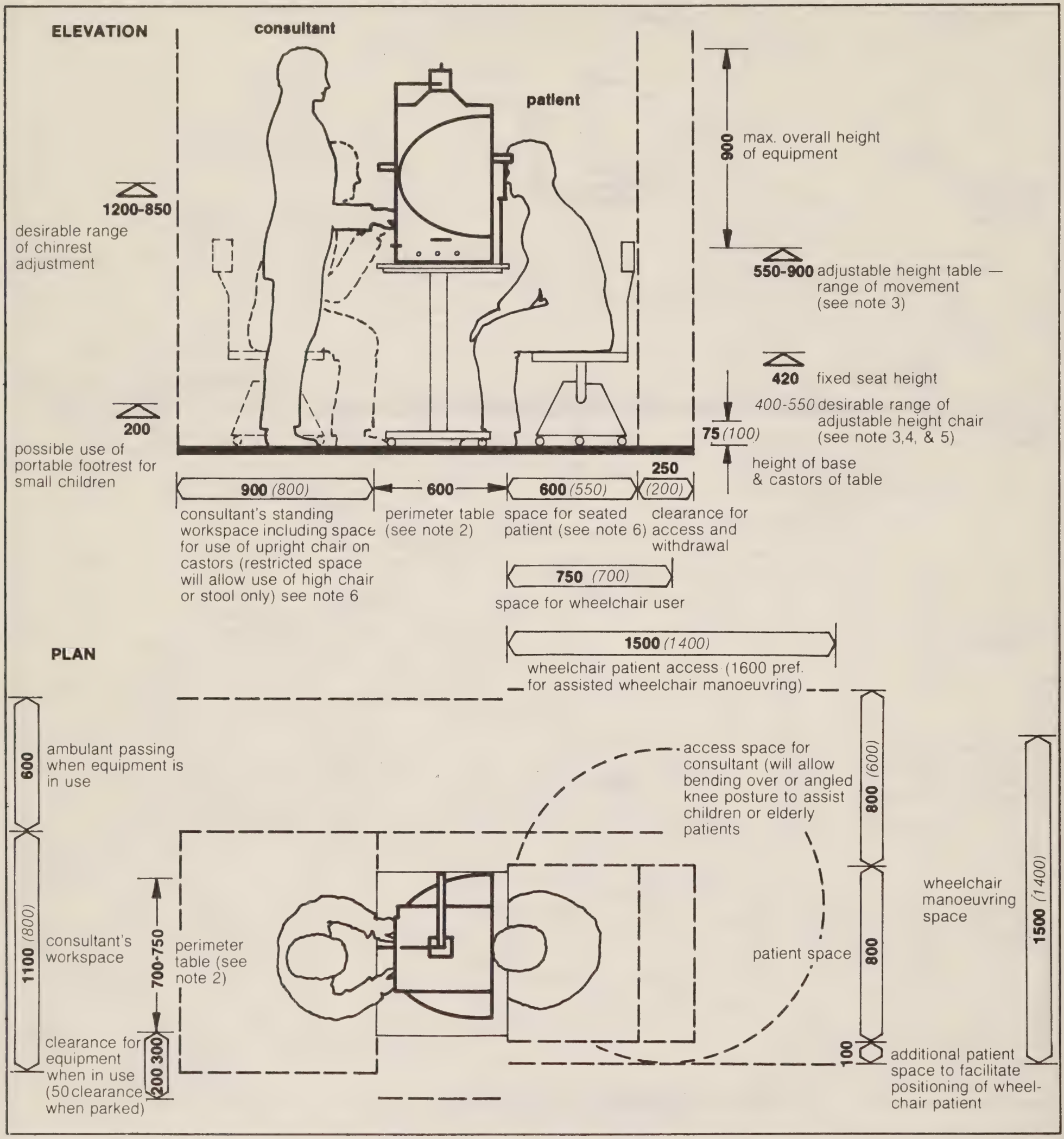
Activities
Facilities for examination of the patients eyes using a self-recording perimeter. The patient is seated for the examination and the recording of results is supervised by a member of staff standing or occasionally sitting behind the perimeter and with good working side access to patient. Examination takes place in a dark or darkened room.

DHSS **Ergonomic data bank**
Component-user data sheet, not to scale

Perimeter

Self recording

Users
Ophthalmic staff & adults, children occasional wheelchair users.


ELEVATION
consultant
patient
1200-850
desirable range of chinrest adjustment
200
possible use of portable footrest for small children
900 max. overall height of equipment
550-900 adjustable height table — range of movement (see note 3)
420 fixed seat height
400-550 desirable range of adjustable height chair (see note 3,4, & 5)
75 (100) height of base & castors of table
900 (800) consultant's standing workspace including space for use of upright chair on castors (restricted space will allow use of high chair or stool only) see note 6
600 perimeter table (see note 2)
600 (550) space for seated patient (see note 6)
250 (200) clearance for access and withdrawal
750 (700) space for wheelchair user
1500 (1400) wheelchair patient access (1600 pref. for assisted wheelchair manoeuvring)
PLAN
600 ambulant passing when equipment is in use
1100 (800) consultant's workspace
700-750 perimeter table (see note 2)
200 300 clearance for equipment when in use (50 clearance when parked)
access space for consultant (will allow bending over or angled knee posture to assist children or elderly patients
patient space
800 (600)
800
100
wheelchair manoeuvring space
1500 (1400)
additional patient space to facilitate positioning of wheelchair patient

1350 *(1300)*

Preferred minimum *Restricted minimum (not recommended for general use: see explanatory notes)*

Notes

1. The perimeter is an item of equipment which is used to measure the field of vision of the eye.

2. Design of mobile adjustable height table — this should be very stable. The base together with the castors should be low enough to pass under the footrest of a standard wheelchair 75 (100). A cantilever type base is preferred.

3. A minimum table height of 650 is acceptable for adult use, but is not low enough for small children using a 420 fixed height seat.

4. An adjustable height chair is essential as it offers great flexibility, especially in dealing with children and is used in conjunction with an adjustable height table.

5. Wheelchair users, seat height including cushion - 530 (480 without cushion).

6. Lightweight upright chair on castors. Add 50-100 overall (including clearance) for heavier upholstered chairs.

7. The equipment shown cannot conveniently accommodate the whole range of potential users. These recommendations are therefore principally concerned with accommodating adult use and use by large children. Use by smaller children will essentailly require some improvisation or adaptation.

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